

Adjustment DE-A regarding NO_x from Road Vehicles

PREFACE

When deriving proposals for national emission ceilings for negotiations of the 1999 Gothenburg Protocol, sector-specific emission estimates for the year 2010 were calculated at IIASA using a set of scenarios which assumed various technological abatement measures, policy incentives, and legislation available / in place or planned at that time. As a result, the 2010 emission by road transport in Germany was estimated at NO_x (IIASA, 1999) ¹⁾. The over-all 2010 national emission ceiling (NEC) for NO_x was set to 1,081 kt. When negotiating the EU NEC Directive two years later, Germany agreed to reduce its NO_x emissions further, resulting in a NEC of 1,051 kt.

In its 2016 NEC emissions reporting, Germany provided a national total for NO_x emissions of 1,337 kt for 2010. However, this total includes emissions from agricultural soils and other source categories not accounted for when setting the NEC. In addition, some assumptions made in 1999, including on emission factors from road traffic, turned out to be wrong in reality. Like in many other European countries, non-compliance with the 2010 NEC as set in 1999 was partly not caused by failed national mitigation policies, but by changes beyond the control of, and unforeseen by, the individual Party or Member State.

In order to differentiate such changes from policy failures in the responsibility of the individual Parties to the Gothenburg Protocol, a procedure (Inventory Adjustment) allowing the adjustment of emissions resulting from new emission categories, changes in estimation methodologies, emission factors etc. provided within the EMEP/EEA Guidebook, or other effects beyond national control with respect to complying to emission reduction obligations (EB, 2012 a & c) ^{2), 3)} was agreed. This procedure is applicable also for existing NECs (EB, 2012b) ⁴⁾.

With respect to road transport, such an unforeseeable effect was the partial failure of several so-called “Euro norms” set on the EU level to reduce emissions from road vehicles. In this report, Germany presents an estimate of the NO_x emissions resulting from the partial failure of the mitigation policy reflected by the Euro norms, and lays out the calculations leading to these estimates.

REASONS FOR MISSING THE GOTHENBURG CEILINGS

The TREMOD methodology applied for estimating emissions from road transportation in Germany has changed over time. These changes include updates of emission factors (EF) for various pollutants and other changes such as an extension of vehicle classification (and thus inclusion of emission factors associated with these new vehicle sub-categories) to improve the estimation's accuracy.

The main changes occurred for the emission factors and for the Heavy Duty Vehicles (HDV) fleet structure. This last point led to changes in emissions because of the reallocation of activities (consumption/traffic) between the sub-categories of vehicles.

For the formalism of the adjustments, it is difficult to flag whether the modifications for road transport are due to “methodological changes” or due to “changes of emission factor”. Therefore, only the term “change of methodology” will be used (even if at the NFR reporting level this may seem like a simple change in EFs).

So far as road transport is concerned, the inability to attain the emission ceiling is most likely to have been affected by a combination of technological changes within the fleet (which of course made their way into the several versions of TREMOD) combined with greater than originally expected dieselisation of the fleet.

ANALYSING THE PROBLEM: THE EUROPEAN PERSPECTIVE BASED ON COPERT

Already in 2011, these effects were demonstrated by Ntziachristos and Papageorgiou (2011) ⁵⁾. Here, the impacts of changing model versions and activity data in the context of meeting the EU NEC Directive ceiling commitments were examined for four European countries including Germany. Unfortunately, this comparison study was carried out within a COPERT environment. Therefore, the results gained cannot be transferred to the German TREMOD environment on a one-to-one level but nonetheless allow a highly illustrative insight in the reasons for not meeting the set ceiling. The study modeled fuel consumption and NO_x emissions for four selected countries (Germany, France, Netherlands and Belgium) and found higher NO_x emissions were estimated for the road transport sector than originally modelled by the RAINS model of IIASA (which underpinned the setting of 2010 ceilings). For Germany, this study shows that with the same activity data set (LIFE+

EC4MACS data from Amann et al. (2010)), NO_x emissions estimated with COPERT II vs. COPERT 4 (v8.0) increase from 410 kt to 518 kt due to methodological changes, a difference of 282 kt. An additional consideration of changes in AD would lead to 620 kt of NO_x. However, as changes in AD are no valid adjustment reason, the latter value is for information only.

This was mainly due to: * NO_x "artificial" current emissions = virtual current emissions assuming no changes in emission factors emission factors updated in COPERT 4 that did not follow the reductions as set by the emission standards for diesel passenger cars; * important part of diesel fuel consumption in the total fuel consumption of the road traffic.

The results of this study showed that it is the combination of different parameters which might affect the ability (to different extents) of a Party to attain the emission ceilings. In other words, the exceeding of NO_x ceilings for road transport is due to:

Changes in methodology and emission factors

As these technologically driven changes (as reflected in the evolution of the different so-called Euro norms) lie outside the country's responsibility, current methodology and EFs have to be adjusted in a way to allow the comparison of the actual inventory and the Gothenburg ceilings.

Changes in the activity data

As the development of mileage driven and fuels used within a country (Germany: stronger dieselisation then originally expected) is of the country's responsibility, this effect has to be excluded from any adjustment estimation.

IN-COUNTRY ANALYSIS: THE TREMOD PERSPECTIVE

INITIAL ASSUMPTION

In order to estimate the effect of NO_x emissions resulting from the failure of the so-called Euro norms, the following procedure has been agreed by expert review teams in the last two years:



proposed amount of adjustable emissions = current AD x current EF - current AD x original EF = current AD x (current EF - original EF)
= current EM - "artificial" current EM¹

¹ "artificial" current emissions = virtual current emissions assuming no changes in emission factors



$$\begin{aligned} EM_{\text{adjustment}} &= AD_{\text{current}} * EF_{\text{current}} - AD_{\text{current}} * EF_{\text{original}} \\ &= AD_{\text{current}} * (EF_{\text{current}} - EF_{\text{original}}) \\ &= EM_{\text{current}} - EM_{\text{current "artificial"}} \end{aligned}$$

with

- **EM „adjustment,,** = amount of emissions to be subtracted from National Totals
- **AD „current,,** = AD from latest TREMOD version as used for current submission
- **EF „current,,** = EF from latest TREMOD version as used for current submission
- **EF „original,,** = EF from TREMOD version used at the time NEC ceilings were set (here: TREMOD 3.1)
- **EM „current,,** = EM estimated from AD and EF from latest TREMOD version = EM reported for NFR 1.A.3.b with latest submission
- **EM „current-“artificial”,,** = EM estimated from AD from latest TREMOD version and EF from TREMOD version used at the time NEC ceilings were set (here: TREMOD 3.1)

APPLYING THE ORIGINAL METHODOLOGY

FRAMEWORK INFORMATION

The methodology used for estimating Germany's exhaust emissions from road transport when determining emissions ceilings of the Gothenburg Protocol (1999), was the second version of the EMEP/CORINAIR guidebook corresponding to COPERT II software. This method proposed NO_x emission factors for

- passenger cars (PC): up to Euro 1
- light commercial vehicles (LCV2): up to Euro 1
- heavy duty vehicles (HDV): pre-EURO I only (conventional)

Back then, without better knowledge, the emission factors for the most recent standards were derived by directly applying the expected reductions in emission standards.

However, as Germany does not use COPERT for compiling its road transport emissions inventory but a national model called TREMOD, the following comparison has to be carried out between the oldest version of TREMOD still available and the version as applied for the current inventory submission (2021).

Unfortunately, the oldest TREMOD version available for such comparison is TREMOD 3.1 from 2002 ⁶⁾, including the following set of NO_x emission factors:

- passenger cars (PC): up to Euro 4
- light commercial vehicles (LCV): up to Euro 4
- heavy duty vehicles (HDV) only up to EURO V

However, as this version includes the technological development since 1999 (when the ceilings were set based on COPERT II), the results from this analysis and the adjustment proposal based upon these results are likely to slightly underestimate the effect of technological changes since 1999 and must therefore be considered conservative.

THE COMPARISON

Application of the original NO_x methodology to the current road transport background activity data

The *basic activity data* (such as over-all fuel sold and traffic mileages by vehicle type, by fuel or by Euro regulation) implemented in TREMOD 3.1 differ significantly from those of the current TREMOD version especially for the more recent years as of 2005. In addition, *specific activity data* (such as fuel consumptions per vehicle type, per fuel or per Euro regulation) strongly depend on the TREMOD version.

Within this report, Germany re-estimates the NO_x emission within the TREMOD 3.1 model. To isolate the requested information, the original TREMOD 3.1 activity data was combined with emission factors from both TREMOD 3.1 and the currently used TREMOD 6.12 (Knörr et al., 2020a) ⁷⁾.

Description of the updated methodology used

The updated methodology, used in 2019 (for NFR submission 2021) and implemented in version 6.12 of the TREMOD software, considers emission factors of

- passenger cars (PC) up to Euro 6d
- light commercial vehicles (LCV) up to Euro 6d
- heavy duty vehicles (HDV) up to EURO VI

and

- motorized two-wheelers (M2W) up to Euro 4

Comparison of emission estimates made using the original and updated methodologies

The values of NO_x emissions presented in the table below are estimated with:

- TREMOD 3.1 model equations as initial methodology

and ,

- TREMOD 6.12 equations as methodology applied for NEC submission 2021.

The activity data applied to initial (here: oldest available) and most recent methodology, are those of the latest inventory provided with NEC submission 2021.

Table 1: Resulting adjustment proposal 2020

| for year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| proposed adjustment | -296.1 | -300.7 | -300.4 | -305.2 | -294.9 | -274.9 | -250.9 | -221.1 | -179.6 | -144.8 |

The following screenshots show the TREMOD 3.1 / TREMOD 6.12 implementation comparisons per vehicle type/fuel/Euro regulation.

Activity Data

- **current:** from TREMOD 6.12, as reported with the latest inventory submission
- **adjusted:** has to be similar to **current** AD!
- **difference:** as only recent AD are to be used for adjustment estimations, this value must be zero!

Implied Emission Factor

- **current:** representing the ratio of current emissions and current AD
- **adjusted:** representing the ratio of adjusted emissions and current AD
- **difference:** shows percentual difference

NO_x Emissions

- **current:** from TREMOD 6.12, as reported with the latest inventory submission
- **adjusted:** estimated based on TREMOD 3.1 methodology and TREMOD 6.12 AD
- **adjustment:** adjusted emissions minus current emissions
- **difference:** percentual difference between current and adjusted emissions

Adjustment overview for years 2010 to 2019

| NFR Code | Fuel | Year | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | |
|---------------|------------|------|---------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|------------|
| | | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference |
| | | | in [TJ] | in [TJ] | in [%] | in [kg/TJ] | in [%] | in [%] | in [kg] | in [kg] | in [%] | in [%] |
| 1.A.3.b.i | gasoline | | 795.957 | 795.957 | 0% | 97.55 | 84.99 | -13% | 77.644.842 | 67.690.906 | 9.953.935 | -13% |
| 1.A.3.b.i | diesel oil | | 629.380 | 629.380 | 0% | 429.45 | 160.51 | -63% | 227.341.096 | 84.970.461 | 142.370.635 | -63% |
| 1.A.3.b.ii | gasoline | | 6.325 | 6.325 | 0% | 255.87 | 214.75 | -16% | 1.618.432 | 1.358.328 | 260.104 | -16% |
| 1.A.3.b.ii | diesel oil | | 113.450 | 113.450 | 0% | 476.34 | 134.96 | -72% | 54.040.533 | 15.311.584 | 38.728.949 | -72% |
| 1.A.3.b.iii | diesel oil | | 48.844 | 48.844 | 0% | 823.00 | 482.55 | -23% | 29.931.266 | 23.183.732 | 6.747.534 | -23% |
| 1.A.3.b.iii | diesel oil | | 566.741 | 566.741 | 0% | 446.67 | 271.83 | -39% | 253.148.243 | 154.056.160 | 99.092.083 | -39% |
| 1.A.3.b.iv | gasoline | | 19.712 | 19.712 | 0% | 113.68 | 168.43 | 48% | 2.240.749 | 3.320.034 | -1.079.285 | 48% |
| 1.A.3.b TOTAL | 2010 | | 2.079.608 | 2.079.608 | 0% | | | 0% | 645.965.162 | 349.851.206 | 296.113.956 | -46% |
| 1.A.3.b.i | gasoline | | 794.688 | 794.688 | 0% | 92.09 | 81.61 | -11% | 73.185.851 | 64.851.951 | 8.333.900 | -11% |
| 1.A.3.b.i | diesel oil | | 553.564 | 553.564 | 0% | 434.12 | 159.22 | -63% | 240.313.791 | 88.138.959 | 152.174.832 | -63% |
| 1.A.3.b.ii | gasoline | | 6.118 | 6.118 | 0% | 229.35 | 198.57 | -13% | 1.403.081 | 1.214.776 | 188.305 | -13% |
| 1.A.3.b.ii | diesel oil | | 115.967 | 115.967 | 0% | 481.55 | 126.92 | -74% | 55.844.518 | 14.718.142 | 41.126.376 | -74% |
| 1.A.3.b.iii | diesel oil | | 47.355 | 47.355 | 0% | 592.65 | 448.99 | -24% | 28.071.221 | 21.268.323 | 6.804.898 | -24% |
| 1.A.3.b.iii | diesel oil | | 563.891 | 563.891 | 0% | 410.38 | 244.97 | -40% | 231.410.271 | 138.135.342 | 93.273.929 | -40% |
| 1.A.3.b.iv | gasoline | | 19.289 | 19.289 | 0% | 110.79 | 171.60 | 54% | 2.137.002 | 3.299.162 | -1.162.160 | 54% |
| 1.A.3.b TOTAL | 2011 | | 2.106.883 | 2.106.883 | 0% | | | 0% | 632.365.736 | 331.625.655 | 300.740.081 | -48% |
| 1.A.3.b.i | gasoline | | 750.957 | 750.957 | 0% | 85.73 | 78.00 | -9% | 64.379.994 | 58.677.229 | 5.802.765 | -9% |
| 1.A.3.b.i | diesel oil | | 555.245 | 555.245 | 0% | 435.96 | 158.66 | -64% | 242.062.902 | 88.096.699 | 153.966.203 | -64% |
| 1.A.3.b.ii | gasoline | | 5.657 | 5.657 | 0% | 218.93 | 193.15 | -12% | 1.238.520 | 1.092.662 | 145.859 | -12% |
| 1.A.3.b.ii | diesel oil | | 114.350 | 114.350 | 0% | 481.91 | 128.17 | -75% | 55.106.362 | 13.741.354 | 41.365.008 | -75% |
| 1.A.3.b.iii | diesel oil | | 50.902 | 50.902 | 0% | 533.22 | 384.33 | -28% | 27.141.913 | 19.563.200 | 7.578.704 | -28% |
| 1.A.3.b.iii | diesel oil | | 589.585 | 589.585 | 0% | 381.33 | 224.00 | -41% | 234.829.180 | 132.064.753 | 92.764.428 | -41% |
| 1.A.3.b.iv | gasoline | | 18.268 | 18.268 | 0% | 107.43 | 173.28 | 61% | 1.962.546 | 3.165.439 | -1.202.893 | 61% |
| 1.A.3.b TOTAL | 2012 | | 2.084.964 | 2.084.964 | 0% | | | 0% | 616.721.438 | 316.391.343 | 300.420.094 | -49% |
| 1.A.3.b.i | gasoline | | 749.114 | 749.114 | 0% | 89.35 | 74.85 | -7% | 60.190.007 | 56.071.797 | 4.118.211 | -7% |
| 1.A.3.b.i | diesel oil | | 589.131 | 589.131 | 0% | 437.14 | 158.71 | -64% | 257.633.728 | 93.499.010 | 164.134.718 | -64% |
| 1.A.3.b.ii | gasoline | | 5.578 | 5.578 | 0% | 202.80 | 184.07 | -9% | 1.131.209 | 1.026.727 | 104.482 | -9% |
| 1.A.3.b.ii | diesel oil | | 118.777 | 118.777 | 0% | 480.60 | 114.93 | -76% | 57.083.533 | 13.690.488 | 43.433.045 | -76% |
| 1.A.3.b.iii | diesel oil | | 51.716 | 51.716 | 0% | 509.64 | 260.06 | -29% | 26.350.969 | 18.620.843 | 7.730.126 | -29% |
| 1.A.3.b.iii | diesel oil | | 600.139 | 600.139 | 0% | 353.06 | 287.93 | -41% | 211.887.531 | 124.788.469 | 87.099.062 | -41% |
| 1.A.3.b.iv | gasoline | | 18.229 | 18.229 | 0% | 104.34 | 175.30 | 68% | 1.902.068 | 3.197.038 | -1.294.951 | 68% |
| 1.A.3.b TOTAL | 2013 | | 2.132.683 | 2.132.683 | 0% | | | 0% | 616.079.063 | 316.854.371 | 300.224.692 | -50% |
| 1.A.3.b.i | gasoline | | 752.526 | 752.526 | 0% | 76.03 | 73.09 | -4% | 57.215.533 | 54.988.921 | 2.216.612 | -4% |
| 1.A.3.b.i | diesel oil | | 626.845 | 626.845 | 0% | 435.87 | 159.12 | -63% | 272.876.061 | 95.613.892 | 173.262.169 | -63% |
| 1.A.3.b.ii | gasoline | | 5.845 | 5.845 | 0% | 190.34 | 176.49 | -7% | 1.112.584 | 1.031.612 | 80.972 | -7% |
| 1.A.3.b.ii | diesel oil | | 128.578 | 128.578 | 0% | 475.56 | 110.96 | -77% | 61.146.575 | 14.267.237 | 46.879.338 | -77% |
| 1.A.3.b.iii | diesel oil | | 49.143 | 49.143 | 0% | 468.37 | 339.99 | -27% | 23.017.115 | 16.708.234 | 6.308.881 | -27% |
| 1.A.3.b.iii | diesel oil | | 572.754 | 572.754 | 0% | 314.05 | 196.05 | -38% | 179.874.133 | 112.285.582 | 67.588.551 | -38% |
| 1.A.3.b.iv | gasoline | | 18.673 | 18.673 | 0% | 100.59 | 179.24 | 78% | 1.878.294 | 3.346.794 | -1.468.499 | 78% |
| 1.A.3.b TOTAL | 2014 | | 2.153.563 | 2.153.563 | 0% | | | 0% | 597.120.297 | 302.252.271 | 294.868.025 | -49% |
| 1.A.3.b.i | gasoline | | 715.156 | 715.156 | 0% | 74.30 | 71.73 | -4% | 53.190.787 | 51.300.983 | 1.889.805 | -4% |
| 1.A.3.b.i | diesel oil | | 645.555 | 645.555 | 0% | 426.19 | 159.80 | -63% | 275.130.233 | 103.163.501 | 171.966.732 | -63% |
| 1.A.3.b.ii | gasoline | | 5.793 | 5.793 | 0% | 187.12 | 172.80 | -8% | 1.083.927 | 1.000.999 | 82.928 | -8% |
| 1.A.3.b.ii | diesel oil | | 135.386 | 135.386 | 0% | 489.35 | 187.96 | -77% | 63.605.443 | 14.607.490 | 48.997.953 | -77% |
| 1.A.3.b.iii | diesel oil | | 52.287 | 52.287 | 0% | 458.96 | 327.99 | -29% | 23.997.817 | 17.149.448 | 6.848.370 | -29% |
| 1.A.3.b.iii | diesel oil | | 589.411 | 589.411 | 0% | 266.69 | 187.51 | -30% | 157.189.675 | 110.620.703 | 46.568.973 | -30% |
| 1.A.3.b.iv | gasoline | | 18.459 | 18.459 | 0% | 99.32 | 180.65 | 82% | 1.833.362 | 3.334.472 | -1.501.090 | 82% |
| 1.A.3.b TOTAL | 2015 | | 2.161.976 | 2.161.976 | 0% | | | 0% | 575.931.265 | 301.877.596 | 274.053.670 | -48% |
| 1.A.3.b.i | gasoline | | 715.272 | 715.272 | 0% | 79.93 | 76.65 | -4% | 50.736.367 | 50.535.049 | 201.318 | 0% |
| 1.A.3.b.i | diesel oil | | 675.119 | 675.119 | 0% | 410.36 | 160.76 | -61% | 277.041.660 | 108.535.230 | 168.506.430 | -61% |
| 1.A.3.b.ii | gasoline | | 5.926 | 5.926 | 0% | 180.27 | 171.05 | -5% | 1.068.292 | 1.013.678 | 54.614 | -5% |
| 1.A.3.b.ii | diesel oil | | 144.068 | 144.068 | 0% | 456.12 | 185.62 | -77% | 65.712.732 | 15.216.007 | 50.496.725 | -77% |
| 1.A.3.b.iii | diesel oil | | 54.157 | 54.157 | 0% | 424.73 | 388.24 | -27% | 23.002.109 | 16.683.117 | 6.308.992 | -27% |
| 1.A.3.b.iii | diesel oil | | 594.013 | 594.013 | 0% | 226.31 | 180.97 | -20% | 134.431.699 | 107.496.262 | 26.935.437 | -20% |
| 1.A.3.b.iv | gasoline | | 18.785 | 18.785 | 0% | 95.14 | 181.66 | 89% | 1.805.897 | 3.412.476 | -1.606.579 | 89% |
| 1.A.3.b TOTAL | 2016 | | 2.207.339 | 2.207.339 | 0% | | | 0% | 553.799.558 | 302.901.820 | 250.897.738 | -45% |
| 1.A.3.b.i | gasoline | | 724.571 | 724.571 | 0% | 67.66 | 69.88 | 3% | 49.026.074 | 50.634.714 | -1.607.640 | 3% |
| 1.A.3.b.i | diesel oil | | 696.592 | 696.592 | 0% | 390.65 | 161.95 | -59% | 272.126.091 | 112.810.721 | 159.315.370 | -59% |
| 1.A.3.b.ii | gasoline | | 6.186 | 6.186 | 0% | 171.15 | 167.18 | -2% | 1.058.799 | 1.034.211 | 24.588 | -2% |
| 1.A.3.b.ii | diesel oil | | 153.284 | 153.284 | 0% | 424.66 | 183.89 | -76% | 65.093.930 | 15.925.216 | 49.168.714 | -76% |
| 1.A.3.b.iii | diesel oil | | 53.382 | 53.382 | 0% | 370.80 | 286.71 | -23% | 19.793.901 | 15.304.828 | 4.489.073 | -23% |
| 1.A.3.b.iii | diesel oil | | 596.263 | 596.263 | 0% | 195.02 | 175.92 | -10% | 116.671.141 | 106.246.508 | 11.424.633 | -10% |
| 1.A.3.b.iv | gasoline | | 19.160 | 19.160 | 0% | 92.83 | 183.39 | 98% | 1.778.674 | 3.513.787 | -1.735.114 | 98% |
| 1.A.3.b TOTAL | 2017 | | 2.251.437 | 2.251.437 | 0% | | | 0% | 525.549.410 | 304.469.986 | 221.079.424 | -42% |
| 1.A.3.b.i | gasoline | | 699.027 | 699.027 | 0% | 64.42 | 68.36 | 6% | 45.032.996 | 47.786.817 | -2.753.820 | 6% |
| 1.A.3.b.i | diesel oil | | 666.074 | 666.074 | 0% | 371.66 | 163.30 | -56% | 247.556.063 | 108.768.604 | 138.787.459 | -56% |
| 1.A.3.b.ii | gasoline | | 6.315 | 6.315 | 0% | 158.22 | 160.11 | 1% | 999.199 | 1.011.138 | -11.939 | 1% |
| 1.A.3.b.ii | diesel oil | | 154.259 | 154.259 | 0% | 384.71 | 182.69 | -73% | 59.344.525 | 15.840.310 | 43.504.215 | -73% |
| 1.A.3.b.iii | diesel oil | | 51.634 | 51.634 | 0% | 309.75 | 263.53 | -15% | 15.993.526 | 13.607.106 | 2.386.420 | -15% |
| 1.A.3.b.iii | diesel oil | | 585.186 | 585.186 | 0% | 171.18 | 172.10 | 1% | 180.173.337 | 180.710.869 | -537.532 | 1% |
| 1.A.3.b.iv | gasoline | | 18.497 | 18.497 | 0% | 89.66 | 184.61 | 106% | 1.658.568 | 3.414.767 | -1.756.209 | 106% |
| 1.A.3.b TOTAL | 2018 | | 2.180.993 | 2.180.993 | 0% | | | 0% | 478.758.206 | 291.139.612 | 179.618.593 | -38% |
| 1.A.3.b.i | gasoline | | 704.691 | 704.691 | 0% | 62.30 | 68.45 | 10% | 43.901.941 | 48.238.025 | -4.336.084 | 10% |
| 1.A.3.b.i | diesel oil | | 663.841 | 663.841 | 0% | 345.81 | 165.07 | -52% | 229.566.088 | 109.582.982 | 119.983.106 | -52% |
| 1.A.3.b.ii | gasoline | | 6.683 | 6.683 | 0% | 146.08 | 153.25 | 5% | 976.219 | 1.034.150 | -57.931 | 5% |
| 1.A.3.b.ii | diesel oil | | 159.183 | 159.183 | 0% | 347.42 | 181.90 | -71% | 55.303.535 | 16.221.445 | 39.082.090 | -71% |
| 1.A.3.b.iii | diesel oil | | 52.939 | 52.939 | 0% | 274.41 | 247.81 | -10% | 14.527.012 | 13.118.578 | 1.408.434 | -10% |
| 1.A.3.b.iii | diesel oil | | 595.913 | 595.913 | 0% | 153.35 | 169.17 | 10% | 91.380.760 | 106.809.376 | -15.428.616 | 10% |
| 1.A.3.b.iv | gasoline | | 18.750 | 18.750 | 0% | 86.05 | 186.83 | 117% | 1.613.450 | 3.502.941 | -1.889.491 | 117% |
| 1.A.3.b TOTAL | 2019 | | 2.202.890 | 2.202.890 | 0% | | | 0% | 437.268.744 | 292.497.497 | 144.771.248 | -33% |

| Adjustment details for 2020 | | | | | | | | | | | | |
|--|------------|-------------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [kg] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Cars | 13.685 | 13.685 | 0% | 584.75 | 514.25 | -12% | 7.955.060 | 6.986.917 | -958.143 | -12% |
| | | Car 1 | 36.541 | 36.541 | 0% | 338.50 | 297.71 | -10% | 25.915.925 | 19.189.262 | -7.716.663 | -30% |
| | | Car 2 | 96.425 | 96.425 | 0% | 172.95 | 135.63 | -22% | 16.580.020 | 13.020.026 | -3.568.995 | -22% |
| | | Car 3 | 133.139 | 133.139 | 0% | 58.51 | 70.18 | 20% | 7.790.384 | 9.343.433 | 1.553.129 | 20% |
| | | Car 4 | 444.981 | 444.981 | 0% | 42.27 | 42.19 | 0% | 18.911.389 | 18.773.529 | -137.859 | 0% |
| | | Car 5 | 31.234 | 31.234 | 0% | 18.61 | 42.19 | 127% | 581.142 | 1.317.737 | 736.595 | 127% |
| | | Car 6 | 0 | 0 | 0% | 25.08 | 42.19 | 67% | 2 | 2 | 0 | 0% |
| | | Gasoline total | 795.057 | 795.057 | 0% | 92.55 | 83.59 | -10% | 37.646.042 | 31.650.586 | -5.995.455 | -16% |
| | Diesel Oil | pre-Cars | 10.338 | 10.338 | 0% | 318.13 | 264.95 | -17% | 383.760 | 327.256 | -56.504 | -15% |
| | | Car 1 | 10.338 | 10.338 | 0% | 264.92 | 265.17 | +1% | 3.064.428 | 2.741.387 | -325.121 | -11% |
| | | Car 2 | 50.088 | 50.088 | 0% | 406.90 | 299.19 | -26% | 29.372.795 | 19.974.210 | -9.398.584 | -32% |
| | | Car 3 | 134.025 | 134.025 | 0% | 542.54 | 176.54 | -67% | 72.648.173 | 23.929.276 | -48.718.957 | -67% |
| | | Car 4 | 279.154 | 279.154 | 0% | 384.37 | 140.58 | -63% | 187.299.180 | 39.243.811 | -148.055.349 | -63% |
| | | Car 5 | 53.547 | 53.547 | 0% | 434.70 | 140.58 | -68% | 23.276.735 | 7.527.796 | -15.748.929 | -68% |
| | | Car 6 | 334 | 334 | 0% | 257.62 | 140.58 | -45% | 85.044 | 46.553 | -38.491 | -45% |
| | | Diesel oil total | 529.380 | 529.380 | 0% | 429.45 | 160.55 | -63% | 227.347.096 | 84.970.461 | -142.376.635 | -63% |
| | | Flx Total | 1,325,337 | 1,325,337 | 0% | 238.12 | 155.14 | -36% | 364,985,938 | 152,621,367 | -212,364,570 | -58% |
| 1.A.3.b.i. Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 1,249 | 1,249 | 0% | 627.99 | 545.95 | -13% | 783.320 | 686.871 | -96.449 | -12% |
| | | Car 1 | 367 | 367 | 0% | 361.95 | 297.39 | -18% | 368.969 | 186.620 | -182.348 | -50% |
| | | Car 2 | 1,393 | 1,393 | 0% | 264.75 | 184.41 | -30% | 368.840 | 256.917 | -111.923 | -30% |
| | | Car 3 | 856 | 856 | 0% | 82.47 | 30.83 | -63% | 70.631 | 77.625 | 6.994 | 10% |
| | | Car 4 | 2,420 | 2,420 | 0% | 36.32 | 44.90 | 24% | 87.987 | 188.679 | 28.772 | 34% |
| | | Car 5 | 49 | 49 | 0% | 15.34 | 44.90 | 193% | 750 | 2,218 | 1,468 | 193% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Gasoline total | 6,345 | 6,345 | 0% | 255.87 | 254.75 | -0% | 1,478.832 | 1,358,328 | -120,504 | -8% |
| | Diesel Oil | pre-Cars | 4,876 | 4,876 | 0% | 425.99 | 386.79 | -9% | 2,077.142 | 1,436.983 | -640.159 | -31% |
| | | Car 1 | 9,989 | 9,989 | 0% | 398.18 | 276.24 | -30% | 2,389.080 | 1,289.636 | -1,099.444 | -46% |
| | | Car 2 | 13,126 | 13,126 | 0% | 336.76 | 153.18 | -54% | 4,420.280 | 2,534.731 | -1,885.549 | -43% |
| | | Car 3 | 33,249 | 33,249 | 0% | 531.91 | 150.58 | -72% | 17,665.883 | 5,085.780 | -12,580.123 | -72% |
| | | Car 4 | 54,581 | 54,581 | 0% | 491.42 | 80.69 | -84% | 26,021.036 | 4,040.722 | -21,980.314 | -84% |
| | | Car 5 | 1,629 | 1,629 | 0% | 427.50 | 80.69 | -81% | 696.286 | 144.434 | -551.772 | -80% |
| | | Car 6 | 0 | 0 | 0% | 10.73 | 80.69 | -87% | 7 | 4 | -3 | -43% |
| | | Diesel oil total | 113,450 | 113,450 | 0% | 476.34 | 134.96 | -72% | 54,043,533 | 15,351,584 | -38,691,949 | -72% |
| | | LDVs Total | 179,775 | 179,775 | 0% | 464.70 | 139.18 | -70% | 55,658,966 | 16,689,913 | -38,969,053 | -70% |
| 1.A.3.b.ii. Heavy Duty Vehicles (HDVs) | Gasoline | pre-Cars | 3,382 | 3,382 | 0% | 1096.25 | 1028.78 | -6% | 3,674.087 | 3,432.644 | -241.443 | -7% |
| | | Car 1 | 2,826 | 2,826 | 0% | 749.41 | 732.14 | -2% | 2,117.871 | 2,125.595 | 7.723 | 0% |
| | | Car 2 | 10,152 | 10,152 | 0% | 801.96 | 643.47 | -20% | 8,140.119 | 6,532.213 | -1,607.906 | -20% |
| | | Car 3 | 15,890 | 15,890 | 0% | 633.22 | 437.25 | -30% | 10,865.776 | 7,289.299 | -3,576.477 | -33% |
| | | Car 4 | 5,461 | 5,461 | 0% | 448.63 | 351.65 | -21% | 2,650.016 | 1,921.527 | -728.489 | -27% |
| | | Car 5 | 10,326 | 10,326 | 0% | 337.28 | 182.33 | -46% | 3,882.417 | 1,882.644 | -1,999.773 | -51% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Buses Total | 48,044 | 48,044 | 0% | 623.80 | 482.55 | -23% | 29,931,286 | 23,183,732 | -6,747,554 | -23% |
| | Diesel Oil | pre-Cars | 10,185 | 10,185 | 0% | 1040.16 | 787.37 | -24% | 10,510.623 | 7,754.138 | -2,756.485 | -26% |
| | | Car 1 | 5,677 | 5,677 | 0% | 758.59 | 575.55 | -24% | 4,261.383 | 3,287.681 | -973.702 | -23% |
| | | Car 2 | 38,558 | 38,558 | 0% | 817.62 | 524.79 | -35% | 31,525.526 | 20,234.619 | -11,290.907 | -36% |
| | | Car 3 | 169,023 | 169,023 | 0% | 636.28 | 374.48 | -41% | 161,136.182 | 99,617.271 | -61,518.921 | -38% |
| | | Car 4 | 69,636 | 69,636 | 0% | 368.34 | 280.62 | -24% | 27,183.867 | 20,146.636 | -7,037.231 | -26% |
| | | Car 5 | 283,934 | 283,934 | 0% | 276.42 | 151.65 | -45% | 78,643.643 | 43,115.897 | -35,527.746 | -45% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Trucks Total | 566,741 | 566,741 | 0% | 446.67 | 271.83 | -39% | 293,148,243 | 154,696,160 | -138,452,083 | -47% |
| | | HDVs Total | 7,973 | 7,973 | 0% | 122.80 | 149.18 | 22% | 372.721 | 1,189.383 | 216.502 | 58% |
| 1.A.3.b.iii. Motorised Two-Wheelers (MTWs) | Gasoline | pre-Cars | 5,231 | 5,231 | 0% | 123.77 | 105.74 | -14% | 647.479 | 887.039 | 239.560 | 34% |
| | | Car 1 | 3,587 | 3,587 | 0% | 141.16 | 184.21 | 30% | 585.362 | 686.681 | 101.319 | 17% |
| | | Car 2 | 2,600 | 2,600 | 0% | 38.11 | 184.21 | 381% | 116.180 | 687.032 | 570.852 | 491% |
| | | Car 3 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Car 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Car 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | MTWs Total | 19,172 | 19,172 | 0% | 113.68 | 168.43 | 48% | 2,483.149 | 3,320.634 | 1,837.485 | 74% |
| | | 1.A.3.b. Road Transport | 2,879,688 | 2,879,688 | 0% | 218.62 | 168.23 | -23% | 645,965,162 | 349,851,296 | -296,113,866 | -46% |

| Adjustment details for 2021 | | | | | | | | | | | | |
|---|--|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|--------------|----------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Cars | 13.063 | 13.063 | 0% | 592.96 | 534.68 | -10% | 7.728.235 | 6.979.435 | -748.801 | -10% |
| | | Car 1 | 61.979 | 61.979 | 0% | 347.86 | 340.16 | -2% | 21.560.430 | 18.884.961 | -6.575.479 | -31% |
| | | Car 2 | 87.083 | 87.083 | 0% | 178.38 | 136.58 | -24% | 15.620.983 | 11.883.782 | -3.737.191 | -24% |
| | | Car 3 | 124.330 | 124.330 | 0% | 61.94 | 71.52 | 16% | 7.683.891 | 8.891.671 | 1.207.780 | 16% |
| | | Car 4 | 442.185 | 442.185 | 0% | 43.94 | 43.68 | 0% | 19.384.914 | 19.376.439 | -8.475 | 0% |
| | | Car 5 | 66.057 | 66.057 | 0% | 18.58 | 43.68 | 135% | 1.227.381 | 2.085.636 | 1.658.255 | 135% |
| | | Car 6 | 1 | 1 | 0% | 25.00 | 43.68 | 60% | 17 | 20 | 3 | 18% |
| | | Gasoline total | 794.688 | 794.688 | 0% | 92.69 | 81.65 | -11% | 73.185.851 | 64.851.551 | -8.334.300 | -11% |
| | Diesel Oil | pre-Cars | 1.711 | 1.711 | 0% | 318.90 | 264.56 | -16% | 531.683 | 453.187 | -78.496 | -15% |
| | | Car 1 | 8.426 | 8.426 | 0% | 297.32 | 266.85 | -11% | 2.585.115 | 2.299.987 | -285.119 | -11% |
| | | Car 2 | 42.514 | 42.514 | 0% | 407.93 | 279.27 | -30% | 17.384.549 | 9.321.916 | -7.962.634 | -46% |
| | | Car 3 | 121.429 | 121.429 | 0% | 555.36 | 176.55 | -68% | 67.437.053 | 21.681.386 | -45.755.667 | -68% |
| | | Car 4 | 264.943 | 264.943 | 0% | 388.88 | 143.48 | -63% | 182.817.881 | 30.889.755 | -151.928.126 | -63% |
| | | Car 5 | 113.047 | 113.047 | 0% | 435.12 | 143.48 | -67% | 49.536.960 | 16.332.974 | -33.203.984 | -67% |
| | | Car 6 | 685 | 685 | 0% | 259.59 | 143.48 | -45% | 180.582 | 99.754 | -80.748 | -45% |
| | | Diesel oil total | 553.564 | 553.564 | 0% | 434.12 | 159.92 | -63% | 249.313.791 | 88.138.959 | -161.174.832 | -63% |
| | | Flx Total | 1.348.252 | 1.348.252 | 0% | 232.52 | 133.47 | -51% | 231.699.642 | 152.990.510 | -78.709.132 | -51% |
| 1.A.3.b.i. Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 1.084 | 1.084 | 0% | 626.75 | 545.95 | -9% | 1.082.014 | 780.373 | -301.641 | -28% |
| | | Car 1 | 283 | 283 | 0% | 818.74 | 584.47 | -29% | 243.289 | 86.158 | -157.132 | -65% |
| | | Car 2 | 1.184 | 1.184 | 0% | 268.66 | 191.68 | -29% | 310.529 | 223.189 | -87.340 | -28% |
| | | Car 3 | 783 | 783 | 0% | 85.97 | 35.39 | -59% | 67.320 | 74.782 | 7.361 | 11% |
| | | Car 4 | 2.562 | 2.562 | 0% | 37.38 | 46.51 | 24% | 95.786 | 119.162 | 23.376 | 24% |
| | | Car 5 | 241 | 241 | 0% | 16.13 | 46.51 | 189% | 3.882 | 11.190 | 7.308 | 189% |
| | | Car 6 | 0 | 0 | 0% | 15.33 | 46.51 | 203% | 1 | 2 | 2 | 203% |
| | | Gasoline total | 6.118 | 6.118 | 0% | 229.35 | 186.57 | -18% | 1.483.081 | 1.254.776 | -228.305 | -15% |
| | Diesel Oil | pre-Cars | 3.995 | 3.995 | 0% | 425.99 | 386.79 | -9% | 1.988.280 | 1.225.682 | -762.598 | -38% |
| | | Car 1 | 4.787 | 4.787 | 0% | 398.71 | 276.24 | -30% | 1.984.260 | 1.030.426 | -953.835 | -48% |
| | | Car 2 | 10.816 | 10.816 | 0% | 336.90 | 153.29 | -54% | 3.644.582 | 2.091.063 | -1.553.519 | -43% |
| | 1.A.3.b.ii. Heavy Duty Vehicles (HDVs) | Gasoline | pre-Cars | 3.995 | 3.995 | 0% | 425.99 | 386.79 | -9% | 1.988.280 | 1.225.682 | -762.598 |
| Car 1 | | | 4.787 | 4.787 | 0% | 398.71 | 276.24 | -30% | 1.984.260 | 1.030.426 | -953.835 | -48% |
| Car 2 | | | 10.816 | 10.816 | 0% | 336.90 | 153.29 | -54% | 3.644.582 | 2.091.063 | -1.553.519 | -43% |
| Car 3 | | | 32.125 | 32.125 | 0% | 544.12 | 190.54 | -65% | 18,627.249 | 4,348.078 | -14,279.171 | -65% |
| Car 4 | | | 60.032 | 60.032 | 0% | 402.82 | 89.26 | -78% | 30,029.914 | 5,420.811 | -24,609.104 | -82% |
| Car 5 | | | 6.609 | 6.609 | 0% | 144.05 | 89.26 | -37% | 2,930.190 | 584.364 | -2,345.826 | -80% |
| Car 6 | | | 0 | 0 | 0% | 161.21 | 89.26 | -43% | 14 | 6 | -6 | -43% |
| Diesel oil total | | | 115.961 | 115.961 | 0% | 485.55 | 126.92 | -74% | 55.844.588 | 15.718.142 | -40.126.376 | -74% |
| Diesel Oil | | LDVs total | 122.085 | 122.085 | 0% | 488.92 | 130.95 | -73% | 57.247.599 | 19,932.898 | -37,314.691 | -73% |
| | | pre-Cars | 2.620 | 2.620 | 0% | 100.63 | 101.18 | 0% | 2.626.189 | 2.671.331 | 45.142 | 2% |
| | | Car 1 | 2.258 | 2.258 | 0% | 752.91 | 711.45 | -5% | 1.699.781 | 1.696.297 | -3.484 | 0% |
| | | Car 2 | 3.024 | 3.024 | 0% | 804.17 | 653.36 | -19% | 2.281.125 | 1.837.559 | -443.566 | -20% |
| | | Car 3 | 16.887 | 16.887 | 0% | 633.16 | 457.38 | -28% | 9,425.880 | 6,889.054 | -2,536.827 | -28% |
| | | Car 4 | 5.131 | 5.131 | 0% | 448.88 | 351.81 | -21% | 2,333.330 | 1.681.274 | -648.056 | -28% |
| | | Car 5 | 13.396 | 13.396 | 0% | 336.60 | 182.62 | -46% | 4,589.052 | 2,486.399 | -2,092.653 | -46% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Diesel total | 47.365 | 47.365 | 0% | 902.65 | 448.99 | -50% | 28,071.221 | 21,286.323 | -6,784.898 | -24% |
| 1.A.3.b.iii. Heavy Duty Vehicle: Trucks & Lorries | Diesel Oil | pre-Cars | 8.044 | 8.044 | 0% | 1070.67 | 763.88 | -29% | 8.365.423 | 6.144.933 | -2.210.491 | -26% |
| | | Car 1 | 4.384 | 4.384 | 0% | 758.16 | 574.04 | -24% | 3.288.422 | 2.535.327 | -772.844 | -23% |
| | | Car 2 | 29.277 | 29.277 | 0% | 817.37 | 550.61 | -32% | 23.947.723 | 15.292.273 | -8.655.450 | -36% |
| | | Car 3 | 121.581 | 121.581 | 0% | 636.16 | 436.16 | -32% | 77,271.520 | 45,310.423 | -31,961.097 | -39% |
| | | Car 4 | 68.430 | 68.430 | 0% | 290.35 | 289.43 | -0% | 32.977.784 | 16,969.685 | -6,468.019 | -20% |
| | | Car 5 | 342.175 | 342.175 | 0% | 276.29 | 152.63 | -45% | 96,589.479 | 52,019.687 | -44,569.792 | -54% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Diesel total | 563.891 | 563.891 | 0% | 418.38 | 244.97 | -40% | 215,470.271 | 138,136.342 | -77,333.929 | -36% |
| | MGNs total | pre-Cars | 7.389 | 7.389 | 0% | 322.96 | 150.24 | -53% | 969.580 | 1.110.170 | 21.589 | 22% |
| | | Car 1 | 4.885 | 4.885 | 0% | 134.72 | 108.26 | -19% | 599.299 | 888.547 | 289.248 | 35% |
| | | Car 2 | 3.544 | 3.544 | 0% | 137.85 | 194.58 | 41% | 488.552 | 688.693 | 201.851 | 41% |
| | | Car 3 | 3.560 | 3.560 | 0% | 39.59 | 194.58 | 382% | 160.553 | 680.634 | 519.080 | 382% |
| Car 4 | | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| MGNs total | pre-Cars | 19.289 | 19.289 | 0% | 119.79 | 177.04 | 54% | 2.137.082 | 3,299.162 | 1,162.080 | 54% | |
| | Total | 2.180.883 | 2.180.883 | 0% | 305.90 | 157.85 | -49% | 632.363.736 | 321,625.655 | -310.738.081 | -49% | |

| Adjustment details for 2023 | | | | | | | | | | | | |
|---------------------------------------|------------|-------------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Euro | 11,581 | 11,581 | 0% | 607.72 | 635.38 | -52% | 7,035,041 | 6,189,785 | -836,256 | -52% |
| | | Euro 1 | 47,487 | 47,487 | 0% | 348.56 | 341.62 | -31% | 16,571,746 | 11,426,129 | -5,145,617 | -31% |
| | | Euro 2 | 72,781 | 72,781 | 0% | 194.27 | 137.82 | -29% | 13,487,749 | 10,035,380 | -3,372,369 | -26% |
| | | Euro 3 | 189,443 | 189,443 | 0% | 63.89 | 72.62 | 14% | 6,927,963 | 7,875,172 | 947,209 | 14% |
| | | Euro 4 | 489,541 | 489,541 | 0% | 45.39 | 45.13 | -1% | 18,541,881 | 18,436,736 | -105,145 | -1% |
| | | Euro 5 | 181,961 | 181,961 | 0% | 18.61 | 45.13 | 142% | 1,887,355 | 4,681,311 | 2,793,956 | 142% |
| | | Euro 6 | 282 | 282 | 0% | 25.06 | 45.13 | 74% | 7,339 | 12,736 | 5,399 | 74% |
| | | Gasoline total | 790,267 | 790,267 | 0% | 85.73 | 78.88 | -8% | 64,379,964 | 58,577,229 | -5,802,735 | -9% |
| | Diesel Oil | pre-Euro | 1,487 | 1,487 | 0% | 311.98 | 284.56 | -9% | 463,963 | 383,872 | -80,091 | -9% |
| | | Euro 1 | 6,660 | 6,660 | 0% | 267.79 | 246.44 | -11% | 1,980,364 | 1,771,787 | -208,577 | -11% |
| | | Euro 2 | 33,967 | 33,967 | 0% | 406.82 | 279.27 | -40% | 13,987,432 | 7,445,646 | -6,541,787 | -40% |
| | | Euro 3 | 183,539 | 183,539 | 0% | 564.82 | 176.63 | -69% | 58,389,037 | 18,434,837 | -39,954,200 | -69% |
| | | Euro 4 | 234,943 | 234,943 | 0% | 398.41 | 146.46 | -62% | 91,724,190 | 34,488,997 | -57,235,193 | -62% |
| | | Euro 5 | 173,112 | 173,112 | 0% | 434.89 | 146.46 | -66% | 75,284,364 | 25,353,375 | -49,930,989 | -66% |
| | | Euro 6 | 1,557 | 1,557 | 0% | 259.84 | 146.46 | -44% | 484,664 | 220,086 | -264,578 | -44% |
| | | Diesel oil total | 555,245 | 555,245 | 0% | 415.96 | 158.66 | -64% | 242,962,982 | 88,096,639 | -154,866,343 | -64% |
| | | FCs Total | 1,345,512 | 1,345,512 | 0% | 234.61 | 115.29 | -50% | 386,442,896 | 146,673,867 | -239,769,029 | -50% |
| | Gasoline | pre-Euro | 962 | 962 | 0% | 632.36 | 645.95 | 2% | 607,179 | 621,160 | 13,981 | 2% |
| | | Euro 1 | 232 | 232 | 0% | 803.24 | 383.22 | -56% | 199,985 | 70,295 | -129,691 | -61% |
| | | Euro 2 | 989 | 989 | 0% | 271.16 | 195.74 | -28% | 269,134 | 133,538 | -135,596 | -29% |
| | | Euro 3 | 835 | 835 | 0% | 89.38 | 98.33 | 10% | 14,623 | 82,092 | 7,469 | 10% |
| | | Euro 4 | 2,030 | 2,030 | 0% | 38.49 | 47.58 | 24% | 78,155 | 96,691 | 18,536 | 24% |
| | | Euro 5 | 610 | 610 | 0% | 16.36 | 47.58 | 182% | 9,941 | 29,011 | 19,069 | 182% |
| | | Euro 6 | 0 | 0 | 0% | 15.37 | 47.58 | 210% | 2 | 6 | 4 | 210% |
| | | Gasoline total | 5,657 | 5,657 | 0% | 218.93 | 193.15 | -12% | 1,238,520 | 1,692,662 | 454,142 | 12% |
| | Diesel Oil | pre-Euro | 3,281 | 3,281 | 0% | 424.46 | 386.79 | -9% | 1,368,754 | 982,093 | -376,661 | -9% |
| | | Euro 1 | 3,666 | 3,666 | 0% | 399.34 | 276.24 | -30% | 1,445,960 | 787,634 | -658,326 | -46% |
| | | Euro 2 | 8,479 | 8,479 | 0% | 336.40 | 133.39 | -49% | 2,852,325 | 1,639,772 | -1,212,553 | -43% |
| | | Euro 3 | 23,785 | 23,785 | 0% | 558.53 | 150.44 | -73% | 13,050,281 | 3,565,082 | -9,485,199 | -73% |
| | | Euro 4 | 59,485 | 59,485 | 0% | 494.22 | 89.85 | -82% | 29,369,070 | 5,337,395 | -24,031,675 | -82% |
| | | Euro 5 | 15,964 | 15,964 | 0% | 442.70 | 89.85 | -80% | 7,040,461 | 1,420,906 | -5,619,555 | -80% |
| | | Euro 6 | 1 | 1 | 0% | 15.14 | 89.85 | -81% | 122 | 72 | -50 | -41% |
| | | Diesel oil total | 114,550 | 114,550 | 0% | 485.91 | 126.17 | -75% | 55,186,382 | 13,741,354 | -41,445,028 | -75% |
| | | LDVs Total | 129,088 | 129,088 | 0% | 489.51 | 123.61 | -74% | 56,344,903 | 14,834,656 | -41,510,247 | -74% |
| 1.A.3.b.ii. Heavy Duty Vehicles Buses | Gasoline | pre-Euro | 1,326 | 1,326 | 0% | 1091.46 | 1919.46 | 4% | 1,410,640 | 1,352,283 | -58,357 | -4% |
| | | Euro 1 | 1,246 | 1,246 | 0% | 727.34 | 731.15 | 1% | 1,017,476 | 1,017,184 | -292 | -1% |
| | | Euro 2 | 7,789 | 7,789 | 0% | 703.46 | 643.34 | -9% | 5,085,091 | 4,597,478 | -487,613 | -9% |
| | | Euro 3 | 14,483 | 14,483 | 0% | 629.94 | 457.61 | -27% | 9,073,137 | 6,689,744 | -2,383,393 | -27% |
| | | Euro 4 | 5,331 | 5,331 | 0% | 468.10 | 361.86 | -22% | 2,642,179 | 1,675,777 | -966,402 | -23% |
| | | Euro 5 | 20,752 | 20,752 | 0% | 347.84 | 182.99 | -47% | 7,219,563 | 2,787,467 | -4,432,096 | -47% |
| | | Euro 6 | 73 | 73 | 0% | 64.52 | 182.99 | 236% | 3,961 | 13,296 | 9,334 | 236% |
| | | Buses Total | 50,962 | 50,962 | 0% | 533.22 | 384.33 | -28% | 27,141,913 | 19,965,288 | -7,176,625 | -28% |
| | Diesel Oil | pre-Euro | 6,922 | 6,922 | 0% | 1036.95 | 758.82 | -27% | 7,107,543 | 5,252,345 | -1,855,198 | -27% |
| | | Euro 1 | 3,630 | 3,630 | 0% | 743.70 | 570.57 | -24% | 2,721,326 | 2,071,111 | -650,215 | -24% |
| | | Euro 2 | 23,577 | 23,577 | 0% | 818.27 | 516.43 | -37% | 19,262,253 | 12,175,855 | -7,086,398 | -37% |
| | | Euro 3 | 96,736 | 96,736 | 0% | 634.65 | 370.21 | -42% | 61,387,137 | 35,888,665 | -25,498,472 | -42% |
| | | Euro 4 | 69,550 | 69,550 | 0% | 366.50 | 288.44 | -21% | 19,982,680 | 14,680,877 | -5,301,723 | -27% |
| | | Euro 5 | 485,981 | 485,981 | 0% | 261.24 | 152.32 | -40% | 116,149,955 | 61,626,577 | -54,523,378 | -40% |
| | | Euro 6 | 2,380 | 2,380 | 0% | 188.487 | 360.323 | 345% | 188,487 | 360,323 | 171,836 | 223% |
| | | Trucks Total | 589,585 | 589,585 | 0% | 385.33 | 224.69 | -41% | 224,829,180 | 132,064,153 | -92,765,027 | -41% |
| | Gasoline | pre-Euro | 6,780 | 6,780 | 0% | 122.76 | 151.03 | 23% | 822,539 | 1,011,520 | 188,981 | 23% |
| | | Euro 1 | 4,386 | 4,386 | 0% | 134.61 | 171.39 | 28% | 536,615 | 738,050 | 201,435 | 38% |
| | | Euro 2 | 3,267 | 3,267 | 0% | 136.22 | 184.56 | 45% | 445,087 | 636,853 | 191,766 | 43% |
| | | Euro 3 | 3,984 | 3,984 | 0% | 38.66 | 184.56 | 382% | 18,386 | 778,616 | 760,230 | 382% |
| | | Euro 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | MDVs Total | 18,268 | 18,268 | 0% | 107.43 | 175.28 | 61% | 1,982,546 | 3,165,439 | 1,182,893 | 61% |
| | | 1.A.3.b. Road Transport | 2,084,964 | 2,084,964 | 0% | 295.79 | 151.71 | -49% | 616,721,438 | 396,381,343 | -220,340,094 | -49% |

| Adjustment details for 2023 | | | | | | | | | | | | |
|--|---------------------------------------|----------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|-------------|--------------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Euro | 11,680 | 11,680 | 0% | 618.27 | 649.35 | -5% | 7,011,641 | 6,967,452 | -1,044,189 | -5% |
| | | Euro 1 | 37,743 | 37,743 | 0% | 353.78 | 341.68 | -32% | 13,362,966 | 9,129,436 | -4,233,531 | -32% |
| | | Euro 2 | 62,680 | 62,680 | 0% | 188.93 | 139.33 | -27% | 11,889,922 | 8,722,244 | -3,167,678 | -27% |
| | | Euro 3 | 97,782 | 97,782 | 0% | 66.38 | 73.19 | 10% | 6,481,618 | 7,156,920 | 675,303 | 10% |
| | | Euro 4 | 397,911 | 397,911 | 0% | 47.22 | 46.52 | -1% | 18,790,345 | 18,589,937 | -200,407 | -1% |
| | | Euro 5 | 138,063 | 138,063 | 0% | 18.60 | 46.52 | 150% | 2,583,150 | 6,439,691 | 3,856,541 | 150% |
| | Gasoline total | 748,114 | 748,114 | 0% | 88.35 | 74.85 | -16% | 69,190,687 | 56,671,737 | -12,518,950 | -18% | |
| | Diesel Oil | pre-Euro | 1,389 | 1,389 | 0% | 312.32 | 284.56 | -9% | 433,981 | 386,139 | -47,842 | -9% |
| | | Euro 1 | 6,625 | 6,625 | 0% | 298.42 | 266.79 | -11% | 1,679,472 | 1,580,588 | -97,884 | -11% |
| | | Euro 2 | 29,437 | 29,437 | 0% | 406.84 | 279.91 | -40% | 11,983,522 | 6,253,531 | -5,729,991 | -40% |
| | | Euro 3 | 182,795 | 182,795 | 0% | 574.33 | 176.67 | -69% | 53,284,956 | 16,579,373 | -36,705,583 | -69% |
| | | Euro 4 | 222,583 | 222,583 | 0% | 393.55 | 149.27 | -62% | 87,598,471 | 33,225,566 | -54,372,905 | -62% |
| | | Euro 5 | 233,786 | 233,786 | 0% | 435.42 | 149.27 | -66% | 101,787,275 | 34,894,788 | -66,892,487 | -66% |
| | Diesel oil total | 6,436 | 6,436 | 0% | 259.53 | 149.27 | -42% | 1,177,151 | 677,045 | -500,106 | -42% | |
| | FCs Total | 589,131 | 589,131 | 0% | 437.14 | 158.71 | -64% | 257,533,128 | 83,899,619 | -173,633,509 | -64% | |
| | 1.A.3.a.ii. Heavy Duty Vehicles (LDV) | Gasoline | pre-Euro | 1,338,245 | 1,338,245 | 0% | 237.49 | 111.77 | -53% | 317,723,735 | 146,571,356 | -171,152,379 |
| pre-Euro | | | 981 | 981 | 0% | 633.81 | 645.95 | 2% | 568,320 | 579,283 | 10,964 | 2% |
| Euro 1 | | | 194 | 194 | 0% | 803.50 | 389.27 | -56% | 167,261 | 59,326 | -107,935 | -61% |
| Euro 2 | | | 836 | 836 | 0% | 274.42 | 291.18 | 11% | 229,520 | 188,265 | -41,255 | -27% |
| Euro 3 | | | 784 | 784 | 0% | 52.66 | 191.73 | 10% | 72,691 | 79,780 | 7,089 | 10% |
| Euro 4 | | | 1,089 | 1,089 | 0% | 43.70 | 48.89 | 20% | 77,284 | 82,833 | 5,549 | 20% |
| Diesel Oil | | Euro 5 | 966 | 966 | 0% | 16.67 | 48.89 | 183% | 16,187 | 47,268 | 31,081 | 183% |
| | | Euro 6 | 1 | 1 | 0% | 17.66 | 48.89 | 170% | 26 | 72 | 46 | 170% |
| | | Gasoline total | 5,578 | 5,578 | 0% | 262.86 | 184.67 | -3% | 1,131,299 | 1,692,727 | 561,428 | 3% |
| | | pre-Euro | 2,744 | 2,744 | 0% | 424.37 | 386.79 | -9% | 1,168,757 | 844,928 | -323,829 | -9% |
| | | Euro 1 | 2,946 | 2,946 | 0% | 399.37 | 276.25 | -29% | 1,166,762 | 634,586 | -532,176 | -46% |
| | | Euro 2 | 6,982 | 6,982 | 0% | 336.92 | 133.39 | -49% | 2,340,147 | 1,260,674 | -1,079,473 | -46% |
| LDV total | | Euro 3 | 20,421 | 20,421 | 0% | 568.12 | 150.38 | -73% | 11,437,992 | 3,050,837 | -8,387,155 | -73% |
| | | Euro 4 | 55,087 | 55,087 | 0% | 407.72 | 90.45 | -42% | 27,776,400 | 5,040,416 | -22,735,984 | -42% |
| | | Euro 5 | 29,024 | 29,024 | 0% | 441.97 | 90.45 | -40% | 13,181,325 | 2,687,964 | -10,493,361 | -40% |
| | | Euro 6 | 41 | 41 | 0% | 161.20 | 90.45 | -43% | 6,160 | 2,688 | -3,472 | -56% |
| LDV total | 118,777 | 118,777 | 0% | 408.60 | 154.83 | -26% | 57,083,533 | 13,656,488 | -43,427,045 | -26% | | |
| 1.A.3.a.iii. Heavy Duty Vehicles (HDV) | Diesel Oil | LDV total | 124,934 | 124,934 | 0% | 488.14 | 158.63 | -69% | 56,214,142 | 16,677,215 | -43,537,927 | -69% |
| | | pre-Euro | 1,172 | 1,172 | 0% | 1096.68 | 1019.23 | -4% | 1,249,028 | 1,194,143 | -54,885 | -4% |
| | | Euro 1 | 1,054 | 1,054 | 0% | 727.68 | 750.39 | 3% | 786,020 | 791,181 | 24,951 | 3% |
| | | Euro 2 | 6,684 | 6,684 | 0% | 764.97 | 643.48 | -16% | 3,324,968 | 4,379,371 | 1,054,403 | 31% |
| | | Euro 3 | 13,187 | 13,187 | 0% | 638.43 | 473.63 | -24% | 8,262,880 | 5,996,225 | -2,266,655 | -27% |
| | | Euro 4 | 4,946 | 4,946 | 0% | 680.55 | 351.71 | -31% | 2,278,071 | 1,739,796 | -538,274 | -24% |
| | Bees | Euro 5 | 26,096 | 26,096 | 0% | 66.88 | 183.44 | 40% | 8,435,683 | 4,420,743 | -4,014,761 | -40% |
| | | Euro 6 | 537 | 537 | 0% | 44.76 | 183.44 | 310% | 24,047 | 86,672 | 74,625 | 280% |
| | | Bees total | 31,776 | 31,776 | 0% | 509.54 | 340.06 | -29% | 26,390,969 | 16,620,843 | -9,770,126 | -29% |
| | | pre-Euro | 5,983 | 5,983 | 0% | 1039.72 | 717.35 | -29% | 6,072,170 | 4,322,880 | -1,748,303 | -29% |
| | | Euro 1 | 2,965 | 2,965 | 0% | 749.27 | 583.47 | -24% | 2,176,946 | 1,650,960 | -525,877 | -24% |
| | | Euro 2 | 14,444 | 14,444 | 0% | 1,817 | 1,512.45 | -17% | 15,083,081 | 10,949,975 | -4,013,106 | -27% |
| | Heavy Duty Vehicle: Trucks & Lorries | Euro 3 | 15,130 | 15,130 | 0% | 637.33 | 487.23 | -24% | 47,587,440 | 27,881,817 | -19,695,623 | -40% |
| | | Euro 4 | 42,781 | 42,781 | 0% | 356.90 | 287.27 | -27% | 16,936,867 | 12,289,770 | -4,647,097 | -27% |
| | | Euro 5 | 436,980 | 436,980 | 0% | 261.70 | 152.65 | -40% | 123,181,324 | 66,796,436 | -56,384,887 | -40% |
| | | Euro 6 | 18,020 | 18,020 | 0% | 68.87 | 152.65 | 281% | 913,082 | 2,750,630 | 1,837,548 | 281% |
| Trucks total | | 680,139 | 680,139 | 0% | 353.96 | 287.33 | -21% | 218,587,511 | 124,186,469 | -97,899,862 | -47% | |
| pre-Euro | | 6,352 | 6,352 | 0% | 123.87 | 151.79 | 23% | 781,736 | 964,179 | 182,443 | 23% | |
| 1.A.3.b.ii. Motorised Two-Wheelers (MOW) | Euro 1 | 4,013 | 4,013 | 0% | 925.01 | 173.15 | -30% | 582,073 | 634,880 | 52,807 | 30% | |
| | Euro 2 | 3,362 | 3,362 | 0% | 132.24 | 158.58 | 40% | 436,680 | 604,894 | 209,136 | 40% | |
| | Euro 3 | 4,562 | 4,562 | 0% | 39.81 | 195.58 | 381% | 181,690 | 882,175 | 716,565 | 381% | |
| | Euro 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| | Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| | MOWs total | 18,229 | 18,229 | 0% | 104.34 | 175.38 | 68% | 1,982,088 | 3,197,038 | 1,294,951 | 68% | |
| 1.A.3.b. Road Transport | | Total | 2,132,083 | 2,132,083 | 0% | 208.88 | 100 | 616,073,963 | 390,854,371 | -225,224,592 | -36% | |

| Adjustment details for 2024 | | | | | | | | | | | | |
|--|------------|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [g] | in [g] | in [g] | in [g] | |
| 1.A.3.a.i. - Passenger Cars | Gasoline | pre-Cars | 11.647 | 11.647 | 0% | 812.37 | 844.11 | -11% | 7.132.688 | 6.337.484 | -796.844 | -11% |
| | | Car 1 | 30.667 | 30.667 | 0% | 368.77 | 343.93 | -32% | 11.082.246 | 7.480.641 | -3.621.706 | -32% |
| | | Car 2 | 53.486 | 53.486 | 0% | 198.58 | 140.31 | -29% | 10.514.477 | 7.584.432 | -3.018.844 | -29% |
| | | Car 3 | 87.374 | 87.374 | 0% | 65.31 | 73.93 | 7% | 6.955.589 | 6.459.797 | -494.218 | -7% |
| | | Car 4 | 387.759 | 387.759 | 0% | 45.16 | 47.80 | -3% | 19.093.585 | 18.536.099 | -523.557 | -3% |
| | | Car 5 | 171.270 | 171.270 | 0% | 18.59 | 47.80 | 151% | 3.183.282 | 0.187.581 | -5.004.299 | 151% |
| | | Car 6 | 10.315 | 10.315 | 0% | 25.97 | 47.80 | 84% | 267.855 | 433.096 | 225.248 | 84% |
| | | Gasoline total | 752.506 | 752.506 | 0% | 76.03 | 73.89 | -3% | 57.215.533 | 54.988.501 | -2,216,412 | -3% |
| | Diesel Oil | pre-Cars | 1.341 | 1.341 | 0% | 311.73 | 284.66 | -9% | 417.947 | 364.246 | -42.722 | -9% |
| | | Car 1 | 4.892 | 4.892 | 0% | 298.92 | 267.28 | -11% | 1.482.284 | 1.387.643 | -156.951 | -11% |
| | | Car 2 | 23.934 | 23.934 | 0% | 408.71 | 320.45 | -40% | 9.734.484 | 5.276.480 | -4.458.004 | -40% |
| | | Car 3 | 82.749 | 82.749 | 0% | 585.53 | 176.81 | -69% | 48.481.830 | 14.796.245 | -33.685.585 | -69% |
| | | Car 4 | 211.237 | 211.237 | 0% | 297.27 | 151.77 | -62% | 83.917.680 | 32.059.973 | -51.857.706 | -62% |
| | | Car 5 | 285.011 | 285.011 | 0% | 436.38 | 151.77 | -65% | 124.721.396 | 43.370.300 | -81.343.896 | -65% |
| | | Car 6 | 16.081 | 16.081 | 0% | 259.34 | 151.77 | -41% | 4.170.580 | 2.440.686 | -1.729.814 | -41% |
| | | Diesel oil total | 626.045 | 626.045 | 0% | 415.87 | 159.12 | -63% | 272.876.061 | 99.613.892 | -173.262.169 | -63% |
| | | Pkcs Total | 1,338.571 | 1,338.571 | 0% | 238.44 | 152.15 | -53% | 138.091.584 | 154.652.853 | -175.478.269 | -53% |
| | Gasoline | pre-Cars | 986 | 986 | 0% | 632.44 | 645.95 | 2% | 193.683 | 278.724 | 18.844 | 2% |
| | | Car 1 | 173 | 173 | 0% | 968.27 | 989.98 | 64% | 150.074 | 53.575 | -96.499 | -64% |
| | | Car 2 | 748 | 748 | 0% | 204.73 | 287.11 | 31% | 212.888 | 154.839 | -58.029 | -27% |
| | | Car 3 | 771 | 771 | 0% | 98.62 | 185.21 | 7% | 75.982 | 81.070 | 5.078 | 7% |
| | | Car 4 | 1.087 | 1.087 | 0% | 43.47 | 50.15 | 15% | 81.139 | 83.618 | 2.479 | 15% |
| | | Car 5 | 1.374 | 1.374 | 0% | 17.11 | 50.15 | 183% | 23.517 | 68.918 | 45.401 | 183% |
| | | Car 6 | 17 | 17 | 0% | 18.06 | 50.15 | 179% | 212 | 670 | 657 | 179% |
| | | Gasoline total | 5.845 | 5.845 | 0% | 598.34 | 176.49 | -7% | 1,112.584 | 1,031.852 | -88.732 | -7% |
| 1.A.3.b.i. - Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 2.537 | 2.537 | 0% | 428.16 | 386.79 | -21% | 1.985.879 | 1.776.259 | -207.559 | -21% |
| | | Car 1 | 2.588 | 2.588 | 0% | 393.82 | 276.25 | -40% | 987.136 | 639.898 | -347.328 | -40% |
| | | Car 2 | 6.087 | 6.087 | 0% | 338.91 | 193.25 | -42% | 1.385.995 | 1.180.889 | -428.128 | -42% |
| | | Car 3 | 18.220 | 18.220 | 0% | 571.75 | 150.58 | -74% | 10.417.076 | 2.742.056 | -7.675.020 | -74% |
| | | Car 4 | 52.361 | 52.361 | 0% | 498.70 | 91.69 | -82% | 26.164.486 | 4.703.746 | -21.394.748 | -82% |
| | | Car 5 | 46.749 | 46.749 | 0% | 438.44 | 91.69 | -79% | 20.696.234 | 4.258.626 | -16.237.709 | -79% |
| | Diesel Oil | pre-Cars | 187 | 187 | 0% | 151.18 | 91.69 | -40% | 29.829 | 17.974 | -11.855 | -40% |
| | | Diesel oil total | 128.528 | 128.528 | 0% | 415.56 | 170.96 | -77% | 61.146.525 | 14.267.237 | -46.879.318 | -77% |
| | | LDVs Total | 134.423 | 134.423 | 0% | 463.56 | 153.81 | -75% | 62.259.160 | 15.298.849 | -46.968.311 | -75% |
| | Diesel Oil | pre-Cars | 984 | 984 | 0% | 1099.48 | 1919.23 | -5% | 1.062.384 | 1.062.921 | -48.443 | -5% |
| | | Car 1 | 837 | 837 | 0% | 728.12 | 130.98 | -3% | 689.232 | 628.359 | -18.127 | -3% |
| | | Car 2 | 5.586 | 5.586 | 0% | 704.95 | 643.67 | -9% | 4.384.320 | 3.683.441 | -798.887 | -9% |
| | | Car 3 | 11.221 | 11.221 | 0% | 621.20 | 458.38 | -21% | 7.082.740 | 5.143.628 | -1.939.228 | -21% |
| | | Car 4 | 4.278 | 4.278 | 0% | 461.10 | 361.79 | -24% | 1.972.610 | 1.584.978 | -467.632 | -24% |
| | | Car 5 | 22.042 | 22.042 | 0% | 368.55 | 183.99 | -40% | 7.726.921 | 4.065.632 | -3.671.389 | -40% |
| | | Car 6 | 4.182 | 4.182 | 0% | 42.78 | 183.99 | 330% | 178.913 | 789.476 | 610.563 | 330% |
| | | Diesel Total | 49.143 | 49.143 | 0% | 468.37 | 339.99 | -27% | 23.017.115 | 16.788.234 | -6.308.881 | -27% |
| | | Trucks Total | 572.754 | 572.754 | 0% | 314.85 | 196.65 | -38% | 179.874.133 | 112.285.562 | -67.588.551 | -38% |
| 1.A.3.b.ii. - Heavy Duty Vehicles (HDVs) | Gasoline | pre-Cars | 6.185 | 6.185 | 0% | 122.85 | 158.64 | 29% | 795.185 | 974.388 | 218.182 | 29% |
| | | Car 1 | 3.037 | 3.037 | 0% | 134.71 | 174.84 | 40% | 478.514 | 670.859 | 192.346 | 40% |
| | | Car 2 | 3.365 | 3.365 | 0% | 128.94 | 186.25 | 52% | 433.874 | 680.378 | 226.504 | 52% |
| | | Car 3 | 5.385 | 5.385 | 0% | 38.53 | 186.25 | 386% | 299.722 | 1.041.189 | 821.467 | 386% |
| | | Car 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Car 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | HDVs Total | 18.673 | 18.673 | 0% | 108.59 | 179.24 | 78% | 1.878.294 | 3.386.794 | 1.488.499 | 78% |
| | Diesel Oil | pre-Cars | 1.341 | 1.341 | 0% | 311.73 | 284.66 | -9% | 417.947 | 364.246 | -42.722 | -9% |
| | | Car 1 | 4.892 | 4.892 | 0% | 298.92 | 267.28 | -11% | 1.482.284 | 1.387.643 | -156.951 | -11% |
| | | Car 2 | 23.934 | 23.934 | 0% | 408.71 | 320.45 | -40% | 9.734.484 | 5.276.480 | -4.458.004 | -40% |
| | | Car 3 | 82.749 | 82.749 | 0% | 585.53 | 176.81 | -69% | 48.481.830 | 14.796.245 | -33.685.585 | -69% |
| | | Car 4 | 211.237 | 211.237 | 0% | 297.27 | 151.77 | -62% | 83.917.680 | 32.059.973 | -51.857.706 | -62% |
| | | Car 5 | 285.011 | 285.011 | 0% | 436.38 | 151.77 | -65% | 124.721.396 | 43.370.300 | -81.343.896 | -65% |
| | | Car 6 | 16.081 | 16.081 | 0% | 259.34 | 151.77 | -41% | 4.170.580 | 2.440.686 | -1.729.814 | -41% |
| | | Diesel oil total | 626.045 | 626.045 | 0% | 415.87 | 159.12 | -62% | 272.876.061 | 99.613.892 | -173.262.169 | -62% |
| | | Pkcs Total | 1,338.571 | 1,338.571 | 0% | 298.44 | 152.15 | -53% | 138.091.584 | 154.652.853 | -175.478.269 | -53% |
| | Gasoline | pre-Cars | 986 | 986 | 0% | 632.44 | 645.95 | 2% | 193.683 | 278.724 | 18.844 | 2% |
| | | Car 1 | 173 | 173 | 0% | 968.27 | 989.98 | 64% | 150.074 | 53.575 | -96.499 | -64% |
| | | Car 2 | 748 | 748 | 0% | 204.73 | 287.11 | 31% | 212.888 | 154.839 | -58.029 | -27% |
| | | Car 3 | 771 | 771 | 0% | 98.62 | 185.21 | 7% | 75.982 | 81.070 | 5.078 | 7% |
| | | Car 4 | 1.087 | 1.087 | 0% | 43.47 | 50.15 | 15% | 81.139 | 83.618 | 2.479 | 15% |
| | | Car 5 | 1.374 | 1.374 | 0% | 17.11 | 50.15 | 183% | 23.517 | 68.918 | 45.401 | 183% |
| | | Car 6 | 17 | 17 | 0% | 18.06 | 50.15 | 179% | 212 | 670 | 657 | 179% |
| | | | | | | | | | | | | |

| Adjustment details for 2026 | | | | | | | | | | | | |
|--|------------------|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|-------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [g] | in [g] | in [g] | in [g] | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Euro | 15 782 | 15 782 | 0% | 634.75 | 644.11 | -9% | 7 470 914 | 6 410 967 | -1 059 947 | -14% |
| | | Euro 1 | 39 270 | 39 270 | 0% | 372.25 | 341.68 | -8% | 7 545 483 | 4 986 888 | -2 558 595 | -34% |
| | | Euro 2 | 36 062 | 36 062 | 0% | 212.73 | 143.11 | -33% | 7 671 581 | 5 180 897 | -2 490 684 | -33% |
| | | Euro 3 | 83 039 | 83 039 | 0% | 76.17 | 75.50 | -1% | 4 881 482 | 4 759 259 | -122 223 | -1% |
| | | Euro 4 | 334 413 | 334 413 | 0% | 53.74 | 50.17 | -7% | 17 369 364 | 16 777 445 | -591 919 | -3% |
| | | Euro 5 | 183 374 | 183 374 | 0% | 19.09 | 50.17 | 163% | 3 580 745 | 9 189 834 | 5 609 089 | 163% |
| | | Euro 6 | 65 332 | 65 332 | 0% | 25.67 | 50.17 | 95% | 1 768 917 | 3 327 855 | 1 558 938 | 88% |
| | | Gasoline total | 715 272 | 715 272 | 0% | 79.93 | 70.65 | -11% | 58 736 267 | 50 535 049 | -8 201 218 | -14% |
| | Diesel Oil | pre-Euro | 1 280 | 1 280 | 0% | 369.76 | 254.56 | -31% | 386 262 | 339 173 | -47 089 | -12% |
| | | Euro 1 | 3 749 | 3 749 | 0% | 298.36 | 269.66 | -9% | 1 122 449 | 1 011 625 | -110 824 | -10% |
| | | Euro 2 | 16 584 | 16 584 | 0% | 407.19 | 221.43 | -46% | 6 720 132 | 3 663 964 | -3 056 168 | -46% |
| | | Euro 3 | 81 398 | 81 398 | 0% | 802.50 | 179.24 | -78% | 36 991 999 | 11 085 409 | -25 906 590 | -70% |
| | | Euro 4 | 175 040 | 175 040 | 0% | 405.76 | 156.24 | -61% | 71 362 220 | 27 474 086 | -43 888 134 | -61% |
| | | Euro 5 | 299 054 | 299 054 | 0% | 433.34 | 156.24 | -64% | 130 032 044 | 46 019 229 | -83 912 815 | -64% |
| | | Euro 6 | 116 034 | 116 034 | 0% | 268.75 | 156.24 | -41% | 30 427 555 | 10 232 785 | -20 194 770 | -66% |
| | | Diesel oil total | 625 119 | 625 119 | 0% | 418.36 | 160.76 | -61% | 277 947 660 | 188 535 230 | -89 412 430 | -61% |
| | | Pkcs Total | 1 340 391 | 1 340 391 | 0% | 235.75 | 154.41 | -35% | 527 778 627 | 199 070 280 | -328 708 347 | -62% |
| | Gasoline | pre-Euro | 910 | 910 | 0% | 602.79 | 645.35 | -7% | 593 186 | 547 543 | -45 643 | -8% |
| | | Euro 1 | 136 | 136 | 0% | 908.31 | 312.78 | -66% | 122 126 | 42 425 | -79 701 | -66% |
| | | Euro 2 | 540 | 540 | 0% | 308.39 | 217.84 | -29% | 162 311 | 117 737 | -44 574 | -27% |
| | | Euro 3 | 650 | 650 | 0% | 108.43 | 111.57 | -3% | 70 432 | 72 731 | 2 299 | 3% |
| | | Euro 4 | 1 684 | 1 684 | 0% | 43.06 | 52.36 | 21% | 78 714 | 84 003 | 5 289 | 7% |
| | | Euro 5 | 1 724 | 1 724 | 0% | 19.82 | 52.36 | 164% | 34 157 | 80 258 | 46 101 | 164% |
| | | Euro 6 | 363 | 363 | 0% | 19.85 | 52.36 | 181% | 6 764 | 18 992 | 12 228 | 181% |
| | | Gasoline total | 5 506 | 5 506 | 0% | 388.27 | 171.66 | -56% | 1 068 292 | 1 013 478 | -54 814 | -5% |
| | Diesel Oil | pre-Euro | 2 189 | 2 189 | 0% | 414.81 | 385.79 | -7% | 899 549 | 846 433 | -53 116 | -6% |
| | | Euro 1 | 1 790 | 1 790 | 0% | 391.89 | 276.25 | -30% | 780 189 | 585 371 | -194 818 | -25% |
| | | Euro 2 | 4 223 | 4 223 | 0% | 323.43 | 153.31 | -53% | 1 365 594 | 676 452 | -689 142 | -50% |
| | | Euro 3 | 13 582 | 13 582 | 0% | 558.91 | 150.77 | -74% | 8 064 323 | 2 040 233 | -6 024 090 | -74% |
| | | Euro 4 | 43 141 | 43 141 | 0% | 504.48 | 32.40 | -94% | 21 783 989 | 3 986 141 | -17 797 848 | -82% |
| | | Euro 5 | 74 231 | 74 231 | 0% | 434.16 | 32.40 | -93% | 32 223 283 | 6 658 730 | -25 564 553 | -79% |
| | | Euro 6 | 4 921 | 4 921 | 0% | 113.49 | 32.40 | -71% | 755 285 | 454 676 | -300 609 | -40% |
| | | Diesel oil total | 148 068 | 148 068 | 0% | 454.12 | 185.62 | -59% | 65 712 132 | 15 256 007 | -50 456 125 | -77% |
| | | DNVs Total | 149 994 | 149 994 | 0% | 445.23 | 188.29 | -58% | 66 781 625 | 16 229 684 | -50 551 941 | -76% |
| 1.A.3.b.i - Heavy Duty Vehicles - Buses | Diesel Oil | pre-Euro | 891 | 891 | 0% | 1076.81 | 1919.23 | -43% | 964 197 | 988 234 | 24 037 | 2% |
| | | Euro I | 583 | 583 | 0% | 731.36 | 732.67 | 0% | 433 675 | 446 236 | 12 561 | 3% |
| | | Euro II | 4 375 | 4 375 | 0% | 708.25 | 645.03 | -9% | 3 440 614 | 2 822 621 | -617 993 | -18% |
| | | Euro III | 10 333 | 10 333 | 0% | 632.87 | 458.91 | -28% | 6 530 364 | 4 741 827 | -1 788 537 | -27% |
| | | Euro IV | 4 449 | 4 449 | 0% | 475.90 | 382.29 | -20% | 2 117 219 | 1 566 881 | -550 338 | -26% |
| | | Euro V | 34 360 | 34 360 | 0% | 366.36 | 185.22 | -49% | 8 935 974 | 4 617 617 | -4 318 357 | -49% |
| | | Euro VI | 9 126 | 9 126 | 0% | 62.79 | 185.22 | 196% | 573 066 | 1 680 431 | 1 107 365 | 196% |
| | | Buses Total | 54 157 | 54 157 | 0% | 404.73 | 388.24 | -4% | 23 082 189 | 16 885 117 | -6 197 072 | -27% |
| | Trucks & Lorries | pre-Euro | 3 933 | 3 933 | 0% | 1034.81 | 737.35 | -29% | 4 087 249 | 2 980 379 | -1 106 870 | -28% |
| | | Euro I | 1 555 | 1 555 | 0% | 748.16 | 587.92 | -22% | 1 163 482 | 789 813 | -373 669 | -32% |
| | | Euro II | 8 876 | 8 876 | 0% | 817.75 | 585.42 | -28% | 7 258 047 | 4 486 626 | -2 771 421 | -38% |
| | | Euro III | 34 167 | 34 167 | 0% | 638.91 | 588.64 | -8% | 21 553 280 | 12 251 155 | -9 302 125 | -43% |
| | | Euro IV | 34 287 | 34 287 | 0% | 396.94 | 281.86 | -29% | 9 640 384 | 6 885 621 | -2 754 763 | -29% |
| | | Euro V | 269 735 | 269 735 | 0% | 267.22 | 153.60 | -42% | 74 680 233 | 39 976 610 | -34 703 623 | -46% |
| 1.A.3.b.ii - Motorised Two-Wheelers (MOWs) | Gasoline | pre-Euro | 5 543 | 5 543 | 0% | 125.59 | 155.78 | 24% | 696 072 | 883 289 | 187 217 | 24% |
| | | Euro 1 | 3 360 | 3 360 | 0% | 127.11 | 177.29 | 39% | 427 113 | 585 796 | 158 683 | 39% |
| | | Euro 2 | 3 375 | 3 375 | 0% | 125.94 | 187.68 | 50% | 421 961 | 687 078 | 265 117 | 63% |
| | | Euro 3 | 6 443 | 6 443 | 0% | 48.36 | 187.68 | 381% | 209 627 | 1 273 671 | 1 064 044 | 508% |
| | | Euro 4 | 66 | 66 | 0% | 17.47 | 187.68 | 1071% | 1 134 | 12 632 | 11 498 | 1011% |
| | | Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | MOWs Total | 16 185 | 16 185 | 0% | 96.14 | 181.68 | 89% | 1 885 897 | 3 452 476 | 1 566 579 | 83% |
| | Road Transport | pre-Euro | 2 267 339 | 2 267 339 | 0% | 258.89 | 137.22 | -46% | 553 799 598 | 362 981 620 | -190 817 978 | -46% |
| | | Total | 2 267 339 | 2 267 339 | 0% | 258.89 | 137.22 | -46% | 553 799 598 | 362 981 620 | -190 817 978 | -46% |

| Adjustment details for 2027 | | | | | | | | | | | | | |
|--|---|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|--------------|-------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | | |
| | | in [T] | in [T] | in [%] | in [g/t] | in [g/t] | in [%] | in [g] | in [g] | in [g] | in [%] | | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Euro | 12 282 | 12 282 | 0% | 636.73 | 644.11 | -11% | 7 614 267 | 6 680 187 | -1 134 080 | -15% | |
| | | Euro 1 | 17 449 | 17 449 | 0% | 372.96 | 341.68 | -8% | 6 588 311 | 4 217 644 | -2 370 667 | -36% | |
| | | Euro 2 | 30 435 | 30 435 | 0% | 217.43 | 141.75 | -35% | 6 617 570 | 4 374 140 | -2 243 430 | -34% | |
| | | Euro 3 | 54 271 | 54 271 | 0% | 78.48 | 76.27 | -3% | 4 254 938 | 4 139 376 | -115 562 | -3% | |
| | | Euro 4 | 315 086 | 315 086 | 0% | 54.96 | 51.25 | -7% | 17 316 320 | 16 511 881 | -804 439 | -5% | |
| | | Euro 5 | 180 240 | 180 240 | 0% | 19.17 | 51.25 | 167% | 3 485 382 | 9 239 815 | 5 754 433 | 167% | |
| | Gasoline total | 724 571 | 724 571 | 0% | 87.66 | 80.88 | -8% | 49 046 874 | 38 634 374 | -10 412 500 | -21% | | |
| | Diesel Oil | pre-Euro | 1 790 | 1 790 | 0% | 364.96 | 254.56 | -31% | 483 963 | 347 626 | -136 337 | -28% | |
| | | Euro 1 | 3 360 | 3 360 | 0% | 298.17 | 271.67 | -9% | 1 082 288 | 910 182 | -172 106 | -16% | |
| | | Euro 2 | 13 788 | 13 788 | 0% | 407.17 | 222.43 | -45% | 5 614 130 | 3 066 393 | -2 547 736 | -45% | |
| Euro 3 | | 52 128 | 52 128 | 0% | 808.95 | 179.65 | -78% | 31 696 478 | 9 364 788 | -22 331 690 | -70% | | |
| 1.A.3.a.ii - Heavy Duty Vehicles (LDV) | Gasoline | Euro 4 | 187 047 | 187 047 | 0% | 418.16 | 158.34 | -61% | 64 733 485 | 24 983 323 | -39 750 162 | -61% | |
| | | Euro 5 | 283 480 | 283 480 | 0% | 423.99 | 158.34 | -63% | 120 187 695 | 44 073 190 | -76 114 505 | -63% | |
| | | Euro 6 | 184 768 | 184 768 | 0% | 262.61 | 158.34 | -40% | 48 521 183 | 20 255 985 | -28 265 198 | -58% | |
| | | Diesel oil total | 696 582 | 696 582 | 0% | 394.65 | 161.95 | -59% | 272 126 081 | 112 890 717 | -159 235 364 | -58% | |
| | | Pkcs Total | 1 421 152 | 1 421 152 | 0% | 225.98 | 155.61 | -31% | 521 152 965 | 163 445 435 | -357 707 530 | -68% | |
| | | Diesel Oil | pre-Euro | 940 | 940 | 0% | 611.41 | 645.35 | -7% | 612 247 | 596 878 | -15 369 | -2% |
| | Euro 1 | | 124 | 124 | 0% | 908.23 | 312.78 | -66% | 112 083 | 39 682 | -72 401 | -65% | |
| | Euro 2 | | 485 | 485 | 0% | 302.12 | 221.62 | -27% | 140 344 | 102 950 | -37 394 | -27% | |
| | Euro 3 | | 596 | 596 | 0% | 118.57 | 115.36 | -3% | 65 955 | 68 812 | 2 857 | 4% | |
| | 1.A.3.a.iii - Light Duty Vehicles (LDV) | Gasoline | Euro 4 | 1 476 | 1 476 | 0% | 50.72 | 53.38 | 5% | 74 877 | 78 816 | 3 939 | 5% |
| Euro 5 | | | 1 680 | 1 680 | 0% | 21.73 | 53.38 | 146% | 35 240 | 89 034 | 53 794 | 153% | |
| Euro 6 | | | 910 | 910 | 0% | 19.18 | 53.38 | 180% | 17 052 | 49 080 | 31 928 | 187% | |
| Gasoline total | | | 6 186 | 6 186 | 0% | 171.55 | 167.18 | -2% | 1 058 199 | 1 034 211 | -24 988 | -2% | |
| Diesel Oil | | | pre-Euro | 2 067 | 2 067 | 0% | 413.41 | 385.79 | -7% | 860 499 | 811 183 | -49 316 | -6% |
| | | | Euro 1 | 1 538 | 1 538 | 0% | 398.47 | 276.25 | -30% | 680 795 | 511 158 | -169 637 | -25% |
| | | Euro 2 | 3 580 | 3 580 | 0% | 321.26 | 153.04 | -53% | 1 143 793 | 687 293 | -456 500 | -40% | |
| | | Euro 3 | 11 684 | 11 684 | 0% | 558.90 | 150.77 | -73% | 5 240 935 | 1 758 212 | -3 482 723 | -67% | |
| 1.A.3.a.iv - Heavy Duty Trucks & Lorries | | Diesel Oil | Euro 4 | 39 050 | 39 050 | 0% | 367.26 | 83.03 | -77% | 13 749 647 | 3 635 025 | -10 114 622 | -73% |
| | | | Euro 5 | 75 789 | 75 789 | 0% | 432.66 | 83.03 | -79% | 32 790 564 | 7 054 565 | -25 735 911 | -79% |
| | Euro 6 | | 19 625 | 19 625 | 0% | 167.71 | 83.03 | -39% | 2 977 239 | 1 626 675 | -1 350 564 | -46% | |
| | Diesel oil total | | 153 284 | 153 284 | 0% | 424.66 | 113.89 | -74% | 65 831 930 | 15 925 274 | -49 906 656 | -74% | |
| | LDVs Total | | 199 470 | 199 470 | 0% | 414.83 | 196.35 | -53% | 66 152 129 | 36 959 427 | -29 192 702 | -44% | |
| | pre-Euro | | 738 | 738 | 0% | 1073.33 | 1013.23 | -5% | 790 259 | 750 425 | -39 834 | -5% | |
| | Euro 1 | 411 | 411 | 0% | 723.97 | 752.57 | 3% | 390 684 | 399 082 | 8 408 | 3% | | |
| | Euro 2 | 3 325 | 3 325 | 0% | 723.91 | 646.79 | -11% | 3 203 087 | 2 147 480 | -1 055 607 | -33% | | |
| | Euro 3 | 8 678 | 8 678 | 0% | 673.23 | 459.12 | -31% | 5 478 480 | 3 984 085 | -1 494 395 | -27% | | |
| | Euro 4 | 3 023 | 3 023 | 0% | 474.07 | 352.49 | -26% | 1 612 380 | 1 347 680 | -264 700 | -16% | | |
| Euro 5 | 21 913 | 21 913 | 0% | 363.92 | 186.64 | -49% | 7 937 975 | 4 053 686 | -3 884 289 | -49% | | | |
| Euro 6 | 14 586 | 14 586 | 0% | 68.52 | 186.64 | 270% | 854 215 | 2 732 580 | 1 878 375 | 218% | | | |
| 1.A.3.a.v - Heavy Duty Trucks & Lorries | Diesel Oil | Buses Total | 53 582 | 53 582 | 0% | 318.80 | 286.71 | -23% | 19 193 981 | 15 384 620 | -3 809 361 | -20% | |
| | | pre-Euro | 3 686 | 3 686 | 0% | 1034.40 | 731.35 | -29% | 3 730 272 | 2 659 076 | -1 071 196 | -29% | |
| | | Euro 1 | 1 711 | 1 711 | 0% | 748.03 | 483.48 | -35% | 902 942 | 614 151 | -288 690 | -31% | |
| | | Euro 2 | 1 337 | 1 337 | 0% | 817.96 | 540.55 | -34% | 5 794 676 | 3 580 026 | -2 214 650 | -38% | |
| | | Euro 3 | 26 586 | 26 586 | 0% | 626.17 | 345.72 | -44% | 18 942 041 | 9 652 565 | -9 289 476 | -49% | |
| | | Euro 4 | 39 082 | 39 082 | 0% | 367.77 | 279.34 | -24% | 7 965 414 | 5 637 487 | -2 328 926 | -30% | |
| | Euro 5 | 264 365 | 264 365 | 0% | 268.16 | 154.36 | -42% | 69 280 789 | 31 085 347 | -38 195 442 | -45% | | |
| | Euro 6 | 335 065 | 335 065 | 0% | 65.82 | 154.36 | 135% | 21 985 366 | 51 735 641 | 29 750 275 | 136% | | |
| | Trucks Total | 598 263 | 598 263 | 0% | 695.92 | 375.92 | -46% | 116 671 141 | 185 248 980 | 68 577 839 | 59% | | |
| | pre-Euro | 5 336 | 5 336 | 0% | 125.91 | 157.13 | 25% | 671 080 | 830 180 | 159 091 | 25% | | |
| Euro 1 | 3 257 | 3 257 | 0% | 126.39 | 177.06 | 41% | 411 617 | 579 244 | 167 627 | 41% | | | |
| Euro 2 | 3 396 | 3 396 | 0% | 122.55 | 190.33 | 52% | 476 293 | 675 548 | 257 248 | 52% | | | |
| Euro 3 | 6 711 | 6 711 | 0% | 41.22 | 180.33 | 363% | 271 187 | 1 336 565 | 1 065 378 | 393% | | | |
| Euro 4 | 830 | 830 | 0% | 0.69 | 0.69 | 0% | 0 | 82 278 | 77 458 | 96% | | | |
| Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | | | |
| MWVs Total | 19 180 | 19 180 | 0% | 52.81 | 183.39 | 96% | 7 782 484 | 3 551 787 | -4 230 614 | -96% | | | |
| 1.A.3.b - Road Transport | Total | 2 291 437 | 2 291 437 | 0% | 273.43 | 175.23 | -42% | 525 563 430 | 384 685 986 | -140 877 444 | -29% | | |

| Adjustment details for 2018 | | | | | | | | | | | | |
|--|------------------|---------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Cars | 12,219 | 12,219 | 0% | 637.58 | 644.11 | -10% | 7,780,965 | 6,648,721 | -1,132,234 | -15% |
| | | Car 1 | 14,362 | 14,362 | 0% | 374.24 | 341.68 | -9% | 5,371,161 | 3,448,643 | -1,922,518 | -36% |
| | | Car 2 | 34,285 | 34,285 | 0% | 221.97 | 111.68 | -50% | 5,360,977 | 2,688,163 | -2,672,814 | -50% |
| | | Car 3 | 43,642 | 43,642 | 0% | 88.16 | 76.96 | -13% | 3,487,781 | 3,388,617 | -99,164 | -3% |
| | | Car 4 | 278,738 | 278,738 | 0% | 55.98 | 52.30 | -7% | 15,683,488 | 14,756,755 | -926,733 | -6% |
| | | Car 5 | 186,830 | 186,830 | 0% | 19.35 | 52.30 | -170% | 3,228,282 | 8,725,668 | 5,497,386 | 170% |
| | Diesel Oil | pre-Cars | 159,041 | 159,041 | 0% | 6.00 | 52.30 | -89% | 4,190,422 | 8,716,250 | 4,525,828 | 89% |
| | | Car 1 | 2,949 | 2,949 | 0% | 303.16 | 254.96 | -16% | 171,040 | 245,173 | 74,133 | 43% |
| | | Car 2 | 10,784 | 10,784 | 0% | 407.20 | 222.67 | -45% | 4,981,983 | 2,483,536 | -2,498,447 | -50% |
| | | Car 3 | 40,786 | 40,786 | 0% | 812.49 | 180.15 | -78% | 24,932,029 | 7,333,241 | -17,598,788 | -71% |
| | | Car 4 | 130,534 | 130,534 | 0% | 414.71 | 180.40 | -56% | 54,133,837 | 20,937,329 | -33,196,508 | -61% |
| | | Car 5 | 251,212 | 251,212 | 0% | 416.25 | 180.40 | -56% | 104,585,786 | 40,293,731 | -64,292,055 | -61% |
| | Diesel oil total | pre-Cars | 220,685 | 220,685 | 0% | 254.87 | 180.40 | -30% | 58,284,140 | 35,680,446 | -22,603,694 | -39% |
| | | Car 1 | 666,076 | 666,076 | 0% | 375.66 | 163.38 | -56% | 247,596,063 | 188,768,684 | -158,767,459 | -56% |
| | | Car 2 | 1,365,181 | 1,365,181 | 0% | 214.34 | 154.68 | -28% | 262,589,060 | 156,555,421 | -106,033,639 | -40% |
| | Gasoline | pre-Cars | 917 | 917 | 0% | 944.51 | 645.95 | -32% | 999,199 | 582,662 | -416,537 | -42% |
| | | Car 1 | 189 | 189 | 0% | 911.58 | 312.78 | -66% | 98,528 | 33,895 | -64,633 | -66% |
| | | Car 2 | 377 | 377 | 0% | 303.84 | 224.45 | -26% | 114,682 | 84,713 | -29,969 | -26% |
| | | Car 3 | 511 | 511 | 0% | 111.92 | 116.84 | 5% | 57,282 | 60,739 | 3,457 | 6% |
| | | Car 4 | 1,275 | 1,275 | 0% | 52.02 | 54.36 | 4% | 65,290 | 69,270 | 3,980 | 4% |
| | | Car 5 | 1,483 | 1,483 | 0% | 23.70 | 54.36 | 129% | 35,160 | 80,626 | 45,466 | 129% |
| | Diesel oil total | pre-Cars | 1,643 | 1,643 | 0% | 19.09 | 54.36 | 182% | 39,560 | 89,326 | 49,766 | 182% |
| | | Car 1 | 6,315 | 6,315 | 0% | 154.22 | 160.11 | 4% | 999,199 | 1,011,136 | 11,937 | 1% |
| | | Car 2 | 1,872 | 1,872 | 0% | 411.51 | 386.79 | -6% | 771,337 | 574,432 | -196,905 | -26% |
| Diesel Oil | pre-Cars | 1,285 | 1,285 | 0% | 389.94 | 276.25 | -25% | 493,129 | 272,286 | -220,843 | -45% | |
| | Car 1 | 2,942 | 2,942 | 0% | 318.56 | 193.88 | -39% | 965,389 | 550,789 | -414,600 | -43% | |
| | Car 2 | 9,363 | 9,363 | 0% | 598.10 | 150.74 | -75% | 5,689,152 | 1,411,299 | -4,277,853 | -75% | |
| | Car 3 | 33,232 | 33,232 | 0% | 509.40 | 93.81 | -82% | 16,929,185 | 3,117,457 | -13,811,728 | -82% | |
| | Car 4 | 66,283 | 66,283 | 0% | 432.92 | 93.81 | -78% | 28,684,080 | 6,217,860 | -22,466,220 | -78% | |
| | Car 5 | 39,482 | 39,482 | 0% | 158.79 | 93.81 | -41% | 5,941,615 | 3,686,228 | -2,255,387 | -38% | |
| Diesel oil total | pre-Cars | 154,259 | 154,259 | 0% | 384.71 | 182.69 | -53% | 59,344,525 | 15,880,316 | -43,464,209 | -73% | |
| | Car 1 | 180,574 | 180,574 | 0% | 375.86 | 184.94 | -52% | 69,343,125 | 36,851,449 | -32,491,676 | -52% | |
| | Car 2 | 547 | 547 | 0% | 1078.16 | 1919.23 | 78% | 589,267 | 557,147 | -32,120 | -5% | |
| 1.A.3.b.i - Heavy Duty Vehicle Buses | Diesel Oil | pre-Cars | 237 | 237 | 0% | 732.67 | 732.67 | 0% | 173,676 | 168,348 | -5,328 | -3% |
| | | Car 1 | 2,270 | 2,270 | 0% | 787.83 | 646.33 | -18% | 1,780,686 | 1,487,437 | -293,249 | -16% |
| | | Car 2 | 6,757 | 6,757 | 0% | 638.89 | 459.32 | -28% | 4,262,734 | 3,183,482 | -1,079,252 | -25% |
| | | Car 3 | 3,043 | 3,043 | 0% | 473.16 | 382.73 | -19% | 1,439,790 | 1,073,333 | -366,457 | -25% |
| | | Car 4 | 18,189 | 18,189 | 0% | 362.42 | 186.37 | -49% | 6,463,266 | 3,376,016 | -3,087,250 | -48% |
| | | Car 5 | 20,670 | 20,670 | 0% | 64.89 | 186.37 | 289% | 1,176,026 | 3,682,314 | 2,506,288 | 289% |
| Diesel oil total | pre-Cars | 91,634 | 91,634 | 0% | 309.75 | 283.53 | -9% | 15,993,546 | 13,687,186 | -2,306,360 | -15% | |
| | Car 1 | 3,262 | 3,262 | 0% | 1034.82 | 737.35 | -29% | 3,375,359 | 2,485,071 | -890,288 | -26% | |
| | Car 2 | 1,094 | 1,094 | 0% | 747.82 | 488.39 | -35% | 918,052 | 512,378 | -405,674 | -44% | |
| 1.A.3.b.ii - Heavy Duty Vehicle Trucks & Lorries | Diesel Oil | pre-Cars | 5,544 | 5,544 | 0% | 817.44 | 581.68 | -29% | 4,532,190 | 2,781,516 | -1,750,674 | -39% |
| | | Car 1 | 20,583 | 20,583 | 0% | 629.54 | 563.68 | -10% | 12,967,751 | 7,277,279 | -5,690,472 | -44% |
| | | Car 2 | 15,912 | 15,912 | 0% | 358.89 | 276.23 | -23% | 6,334,421 | 4,386,424 | -1,947,997 | -31% |
| | | Car 3 | 154,983 | 154,983 | 0% | 292.40 | 154.68 | -47% | 45,964,153 | 24,283,389 | -21,680,764 | -47% |
| | | Car 4 | 381,799 | 381,799 | 0% | 68.78 | 154.68 | 125% | 26,251,482 | 69,665,886 | 43,414,404 | 125% |
| | | Car 5 | 585,186 | 585,186 | 0% | 515.18 | 172.19 | -66% | 188,173,537 | 180,760,889 | -7,412,648 | -4% |
| 1.A.3.b.iii - Motorised Two-Wheelers (M2Ws) | Gasoline | pre-Cars | 4,940 | 4,940 | 0% | 128.95 | 188.61 | 46% | 622,695 | 783,451 | 160,756 | 26% |
| | | Car 1 | 2,966 | 2,966 | 0% | 128.14 | 177.79 | 41% | 374,114 | 527,294 | 153,180 | 41% |
| | | Car 2 | 3,221 | 3,221 | 0% | 129.33 | 188.64 | 46% | 387,596 | 639,833 | 252,237 | 65% |
| | | Car 3 | 6,241 | 6,241 | 0% | 48.24 | 188.64 | 284% | 20,126 | 1,239,686 | 1,219,560 | 284% |
| | | Car 4 | 1,130 | 1,130 | 0% | 58.41 | 188.64 | 324% | 23,966 | 224,682 | 200,716 | 840% |
| | | Car 5 | 0 | 0 | 0% | 0.00 | 188.64 | 0% | 0 | 0 | 0 | 0% |
| M2Ws total | pre-Cars | 18,487 | 18,487 | 0% | 85.66 | 188.61 | 198% | 1,658,568 | 3,454,767 | 1,796,199 | 198% | |
| | Car 1 | 2,180,983 | 2,180,983 | 0% | 215.85 | 133.49 | -38% | 478,758,286 | 291,129,652 | -187,628,634 | -38% | |
| 1.A.3.b. Road Transport | Total | 2,180,983 | 2,180,983 | 0% | 215.85 | 133.49 | -38% | 478,758,286 | 291,129,652 | -187,628,634 | -38% | |

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Adjustment 2014 (accepted) ^{8) 9)} | -105.6 | -101.3 | -95.7 | -91.7 | | | | | | |
| Adjustment 2015 (accepted) ^{10) 11)} | -100.3 | -95.5 | -89.9 | -85.1 | | | | | | |
| Adjustment 2016 (accepted) ^{12) 13)} | -151.3 | -146.9 | -145.1 | -142.5 | -128.1 | | | | | |
| Adjustment 2017 (accepted) ¹⁴⁾ | -151.3 | -146.8 | -145.0 | -142.4 | -127.2 | -100.9 | | | | |
| Adjustment 2018 (accepted) ^{15) 16)} | -172.3 | -174.5 | -177.4 | -180.4 | -171.5 | -148.9 | -123.2 | | | |
| Adjustment 2019 (accepted) ^{17) 18)} | -172.3 | -174.5 | -177.4 | -180.3 | -171.4 | -148.8 | -123.3 | 93.7 | | |
| Adjustment 2020 (accepted) | -297.8 | -302.3 | -301.3 | -306.1 | -294.5 | -269.0 | -244.3 | -214.9 | -174.6 | |
| Adjustment 2021 (proposal) | -296.1 | -300.7 | -300.4 | -305.2 | -294.9 | -274.9 | -250.9 | -221.1 | -179.6 | -144.8 |
| Change against Adjustment 2020 | 1.7 | 1.6 | 0.9 | 0.9 | -0.4 | -5.9 | -6.6 | -6.2 | -5.0 | |

The noticeable differences between the 2017 and 2018 adjustment proposals resulted from an ad-hoc revision of the *Handbook Emission Factors for Road Transport* (HBEFA, version 3.3) in the aftermath of the so-called "Diesel-gate". ¹⁹⁾

The even bigger changes between adjustment 2019 and adjustment proposal 2020 result from an additional rather fundamental revision of the *Handbook Emission Factors for Road Transport* now available in version 4.1 ²⁰⁾ strongly effecting the TREMOD model underlying Germany's emission reporting for road transport and hence any adjustments of NO_x emissions. With such major model revision between submissions 2019 and 2020, the 2020 adjustment proposal differed significantly from the adjustment applied for and accepted in 2019.

In comparison to 2020, the TREMOD model applied for the 2021 submission has been revised only slightly in terms of NO_x emission factors. Hence, the 2021 adjustment proposal differs only slightly from the (accepted) proposal provided with submission 2020.

Adjustment description as provided in IIRs 2014 and 2015:

[image Description%20Adjustment%20DE-A%20-%20NOx%20from%201.A.3.b%20Road%20transport%20-%20IIRs%202014%20%26%202015.pdf](#)

¹⁾ IIASA, 1999: Amann, M.; Bertok, I.; Cofala, J.; Gyarfas, F.; Heyes, Chr.; Klimont, Zb.; Syri, S.; Schöpp, W.: Further analysis of scenario results obtained with the RAINS model - Interim Report to the Ministère de L'Aménagement du Territoire et de l'Environnement Direction de la Prévention des Pollutions et des Risques 20, avenue de Ségur 75302 Paris 07 SP, April 1999 - URL: <https://iiasa.ac.at/web/home/research/researchPrograms/air/policy/france3b.pdf>

²⁾ EB, 2012a: CLRTAP EB Decision 2012/3, ECE/EB.AIR/111/Add.1: Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them URL: http://www.unece.org/fileadmin/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1_ENG_DECISION_3.pdf

³⁾ EB, 2012c: CLRTAP EB Decision 2012/12: Guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them URL: http://www.unece.org/fileadmin/DAM/env/documents/2012/EB/Decision_2012_12.pdf

⁴⁾ EB, 2012b: CLRTAP EB Decision 2012/4: Provisional Application of Amendment to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone URL: http://www.unece.org/fileadmin/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1_ENG_DECISION_4.pdf

⁵⁾ (bibcite 4)

⁶⁾ ifeu, 2002: Final report to UFOPLAN study FKZ 201 45 112 (German version only): Aktualisierung des Daten- und Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1980-2020; Im Auftrag des Umweltbundesamtes; ifeu Institut für Energie- und Umweltforschung Heidelberg GmbH (Institute for Energy and Environmental Research), Wilckensstraße 3, D-69120 Heidelberg, Germany, phone: +49 (0) 6221 / 47 67 -0, fax: +49 (0) 6221 / 47 67 -19, Heidelberg, 31. Oktober 2002

⁷⁾ Knörr et al. (2020a): Knörr, W., Heidt, C., Gores, S., & Bergk, F.: ifeu Institute for Energy and Environmental Research (Institut für Energie- und Umweltforschung Heidelberg gGmbH, ifeu): Fortschreibung des Daten- und Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1960-2035, sowie TREMOD, im Auftrag des Umweltbundesamtes, Heidelberg & Berlin, 2020.

⁸⁾ CEIP, 2014a: Centre on Emission Inventories and Projections (CEIP): CEIP/Adjustment RR/2014/GERMANY: Review of the 2014 Adjustment Application by Germany, URL: https://webdab01.umweltbundesamt.at/download/adjustments2014/Adjustment_Review_Report_GERMANY_2014.pdf?cgiprox_y_skip=1, 5 August 2014.

¹⁰⁾ CEIP, 2015a: Centre on Emission Inventories and Projections (CEIP): CEIP/Adjustment RR/2015/Germany: Review of the 2015 Adjustment Application by Germany, URL:

https://webdab01.umweltbundesamt.at/download/adjustments2015/Germany2015-adj.pdf?cgiproxy_skip=1, September 2015.

¹¹⁾ CEIP, 2015b: Centre on Emission Inventories and Projections (CEIP): CE/EB.AIR/GE.1/2015/10-ECE/EB.AIR/WG.1/2015/13: Review of adjustment applications 2015; URL:

http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ece.eb.air.ge.1.2015.10_ece.eb.air.wg.1.2015.13.AV.pdf, 6 July 2015.

¹²⁾ CEIP, 2016a: Centre on Emission Inventories and Projections (CEIP): Review of the 2016 Adjustment Application by Germany, URL: https://webdab01.umweltbundesamt.at/download/adjustments2016/Germany2016-adj.pdf?cgiproxy_skip=1, 2016.

¹³⁾ CEIP, 2016b: Centre on Emission Inventories and Projections (CEIP): ECE/EB.AIR/GE.1/2016/10-ECE/EB.AIR/WG.1/2016/18: Review of adjustment applications 2016; URL:

http://www.ceip.at/fileadmin/inhalte/emep/pdf/2016/ECE_EB.AIR_GE.1_2016_10_E.pdf, 2016.

¹⁴⁾ CEIP, 2017a: Centre on Emission Inventories and Projections (CEIP): ECE/EB.AIR/GE.1/2017/10-ECE/EB.AIR/WG.1/2017/20: Review of adjustment applications 2017; URL:

http://www.ceip.at/fileadmin/inhalte/emep/pdf/2017/Advance_ece_eb.air.ge.1_2017_10_ece_eb.air.wg.1_2017.pdf, 2017.

¹⁵⁾ CEIP, 2018a: ECE/EB.AIR/GE.1/2018/10-ECE/EB.AIR/WG.1/2018/21: Review of adjustment applications 2018; URL:

https://www.ceip.at/fileadmin/inhalte/emep/pdf/2018/ADJ_ece.eb.air.ge.1.2018.10-ece.eb.air.wg.1.2018.21_advance.pdf, 2018.

¹⁶⁾ CEIP, 2018b:

https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2018/adj_ece.eb.air.ge.1.2018.10-ece.eb.air.wg.1.2018.21_advance.pdf

¹⁷⁾ CEIP, 2019a: Centre on Emission Inventories and Projections (CEIP): ECE/EB.AIR/GE.1/2019/10-ECE/EB.AIR/WG.1/2019/22: Review of adjustment applications 2019; URL:

https://www.ceip.at/fileadmin/inhalte/emep/pdf/2019/ECE_EB.AIR_GE.1_2019_10-1909789E.pdf, 2019.

¹⁸⁾ CEIP, 2019b: https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2019/ece_eb.air.ge.1_2019_10-1909789e.pdf

¹⁹⁾ Keller et al. (2017): Keller, M., Hausberger, S., Matzer, C., Wüthrich, P., & Notter, B.: Handbook Emission Factors for Road Transport, version 3.3 (Handbuch Emissionsfaktoren des Straßenverkehrs 3.3) URL:

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²⁰⁾ Notter et al. (2019): Keller, M., Althaus, H.-J., Cox, B., Knörr, W., Heidt, Ch., Biemann, K., Räder, D.: Handbook Emission Factors for Road Transport, version 4.1 (Handbuch Emissionsfaktoren des Straßenverkehrs 4.1), HBEFA 4.1 Development Report; URL: https://www.hbefa.net/e/documents/HBEFA41_Development_Report.pdf, Bern, Heidelberg, 21. August 2019.